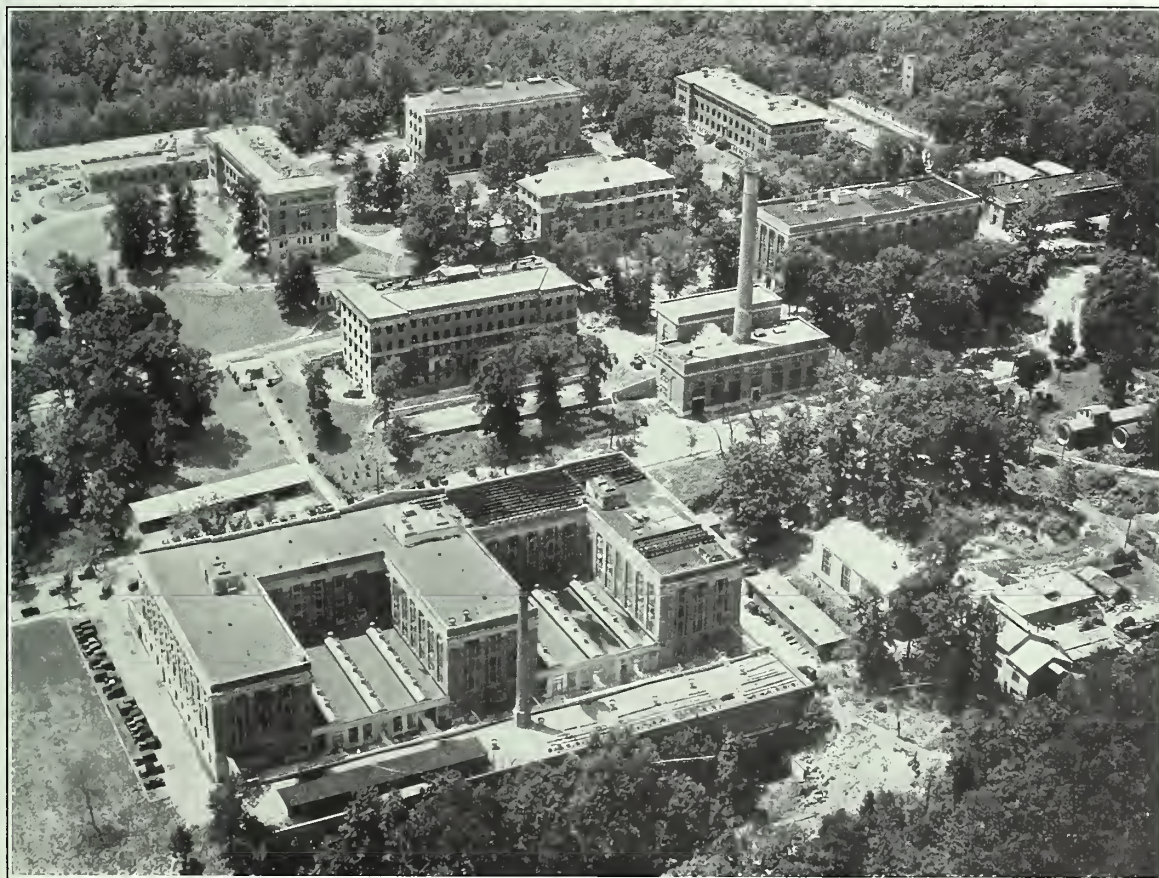


COMMERCIAL STANDARDS MONTHLY



*A Review of Progress in
Commercial Standardization and Simplification*



Photographed by Army Air Corps

AIRPLANE VIEW OF BUREAU OF STANDARDS (LOOKING SOUTH)

ISSUED BY THE BUREAU OF STANDARDS OF THE UNITED
STATES DEPARTMENT OF COMMERCE, WASHINGTON, D. C., U. S. A.

Vol. 8, No. 8



FEBRUARY, 1932

The Commercial Standardization Group

DIVISION OF SIMPLIFIED PRACTICE

Edwin W. Ely

The division of simplified practice cooperates with industrial and commercial groups to reduce waste, usually through eliminating unnecessary variety of product, method, or practice. Its function is to bring together all parties interested in a project of this character, and to coordinate their work in developing a simplified practice recommendation. Such work includes surveys of current practice, formulation of a simplified practice program, and presentation of that program for action by a general conference representing all interests. The division then transmits to all concerned a full report of the general conference, with a request for written acceptance of the action taken. When the volume of acceptances is sufficient to indicate initial success, the Department of Commerce indorses the program and publishes the recommendation. The division thereafter cooperates with a standing committee appointed by the industry concerned, in conducting periodic surveys to determine the degree of adherence, to maintain and extend support of the recommendation, and to secure data for reaffirmation or revision. Simplified practice may be applied to any commodity or activity in which it will reduce waste. The division stands ready to render service in developing and making effective any application of simplified practice which will reduce waste, stabilize business, or extend commerce.

BUILDING AND HOUSING DIVISION

J. S. Taylor

The division of building and housing, formed in 1921, cooperates with business, technical, and professional groups in furthering construction activities. It works to modernize building codes and to encourage improved standards for the quality of building construction, and the practical application of the latest development in design and use of building materials.

It encourages home ownership through the development of an enlarged, steadier, more intelligent, and more discriminating demand for dwellings—the largest single class of buildings which the construction industries provide.

The division also cooperates with other governmental agencies and with many private business and professional groups in efforts to distribute building activity more evenly throughout the year and to secure less fluctuation from year to year.

The work on city planning and zoning has the broad objective of making buildings more useful through proper location with respect to other structures, stabilizing of land values and property uses, well coordinated thoroughfare systems, and well laid out public works.

DIVISION OF SPECIFICATIONS

A. S. McAllister

The duties of the division of specifications are to promote and facilitate the use and unification of specifications. In doing so it carries on activities involving cooperation with technical societies; trade associations; Federal, State, and municipal Government specifications making and using agencies; producers, distributors, and consumers; and testing and research laboratories. It ascertains the Standardization and specifications promoting activities of the associations and societies, and brings to their attention the work being done by the commercial standardization group. It brings the Federal specifications and commercial standards to the attention of the maximum number of producers and users of commodities complying with these standards and specifications. It compiles and distributes lists of sources of supply of materials guaranteed to comply with the standards and specifications. It shows both buyers and sellers the benefits from handling nationally specified, certified, and labeled commodities. The division prepares directories of governmental and nongovernmental testing laboratories and the Directory of Specifications, and is working on an encyclopedia of specifications, the first two volumes of which have been issued, namely, "Standards and Specifications in the Wood-Using Industries" and "Standards and Specifications for Non-metallic Minerals and their Products." It also aids in preparing the Standards Yearbook.

STANDARDIZATION
..IS..
A CONTINUING PROCESS
↔
ITS AIM IS NOT FIXITY
OR STAGNATION
..BUT..
TO ADD SERVICEABILITY
AS OFTEN AS THE
POTENTIAL GAIN
MAKES IT WORTH WHILE

DIVISION OF TRADE STANDARDS

I. J. Fairchild

The division of trade standards, on request, assists industrial and commercial groups in the voluntary establishment of standards covering grades, quality, dimensional interchangeability, or other acceptance criteria as a national basis for marketing manufactured commodities.

The detail criteria are selected or determined voluntarily by interested buyers or sellers, without any Government dictation or domination, and adjusted at a general conference of producers, distributors, and users so as to represent the composite views of all branches. The division functions chiefly as a neutral agency to see that all interested elements are given full opportunity to be heard and satisfied; to solicit and record acceptances; and to publish and promulgate the standard when a satisfactory majority of acceptances is obtained and provided there is no active opposition.

Industries are encouraged to apply self-certifying labels to products meeting the commercial standard requirements, as a means of protecting the consumer and the scrupulous seller from misrepresentation or unfair methods of marketing.

Provision is made for regular revision of the standard through the appointment of a standing committee to consider periodically any necessity for revision of the standard in order that it may be kept constantly compatible with progress in the industry.

COMMERCIAL STANDARDS MONTHLY

A Review of Progress in Commercial Standardization and Simplification

VOLUME 8

WASHINGTON, D. C., FEBRUARY, 1932

NUMBER 8

SUBJECT ANALYSIS

ELECTRICAL		METALS, GLASS, AND RUBBER	
	Page		Page
Radio aids navigation.....	248	Commercial laundry machinery.....	255
Radio broadcasting service standards.....	231	Lock-washer standards.....	252
Telephone industry.....	229	Simplification of dental mouth mirrors and dental rub- bers.....	255
Uniform control of assigned radio frequency.....	237	Sizes of steel spiral rods.....	250
		Standards for machined surfaces.....	239
GROUP ACTIVITIES		PETROLEUM	
American Standards Association.....	233	Fuel oils.....	254
A. S. T. M. committee set up for mortars for unit ma- sonry.....	251	New natural-gasoline grades.....	253
Centralized purchasing at Chicago.....	244	Standard unit for determining quantities of petroleum products.....	252
Federal specifications.....	250		
Gaging California produce by Federal standards.....	241	QUALITY MARKS AND LABELS	
Lock-washer standards.....	255	Certified supplies for school janitors.....	246
New natural-gasoline grades.....	253	Farm marketing in New England.....	243
Oklahoma supervision for grading of grain.....	226	Labeling bread for quality as well as quantity.....	256
Simplification program of California State Chamber of Commerce.....	227	Labeling of canned-salmon variety.....	255
		Terms on sirup labels explained.....	256
INTERNATIONAL AND FOREIGN		SAFETY	
Brazilian Federal purchasing bureau.....	247	Need for uniform methods of railroad-crossing protec- tion.....	249
Germany to standardize motor fuel.....	242	Reducing mine explosions.....	238
Grading and marking of willow products considered by English industry.....	254	Sanitary code proposed for industry.....	228
Simplified practice in Australia.....	253		
Standards for sorting, packing, and marking fresh fruits in Norway.....	250	TEXTILES AND LEATHER	
		Bag, case, and strap leather.....	251
MANAGEMENT		Grading of hides and skins.....	232
Centralized purchasing at Chicago.....	244	Wool and part-wool blankets.....	253
Certified supplies for school janitors.....	246		
Coated abrasive products.....	230	WOOD, CLAY, AND PAPER	
Economies in store wrapping and packing.....	235	Economies in store wrapping and packing.....	235
Feldspar.....	252	Mop sticks.....	238
Industry has developed 154 simplified practice recom- mendations to date.....	254	Red-cedar shingles.....	253
Promoting home ownership plans.....	245	Standing committee for paper simplification reorgan- ized.....	256
Standardization in communication.....	251	Staple porcelain plumbing fixtures.....	240
Standards for machined surfaces.....	239		
Western Union office supplies are standard.....	234		

AN INVITATION TO VISIT THE BUREAU OF STANDARDS

A cordial invitation is extended to all interested in scientific progress to visit the laboratories of the Bureau of Standards when in Washington. A personally conducted trip is organized at 2.15 p. m. daily except on holidays. Special trips for groups may be arranged at other times by writing to the bureau in advance. The bureau's illustrated Visitor's Manual may be had for the asking. This lists the work in progress and gives an airplane view of the ensemble and a brief statement of typical discoveries and inventions which have been notable, basis contributions to radio, aviation, and other modern arts and industries.

OKLAHOMA SUPERVISION FOR GRADING OF GRAIN

By E. H. LINZEE
Grain Inspector, State of Oklahoma

OKLAHOMA is the only wheat-growing State that maintains a department for the free use of the grain farmer.

The State Grain Inspection Department was created for the purpose of giving the farmer information that will help him to market his wheat to the best advantage, also to place the proper grade on the grain that is placed in storage in State-bonded warehouses operated under the State Board of Agriculture. The law requires that the State grain inspector be a Federal licensed inspector the same as all other grain inspectors must be.

A chemist with a fully equipped laboratory is maintained under the direction of the Board of Agriculture from funds received from the sale of feed tags. The laboratory is for the use of different departments under the Board of Agriculture, such as the grain inspection, feed and fertilizer inspection, dairy inspection departments, and the State veterinarian. In this way the farmers can send samples of their wheat and have protein tests made to find if they have wheat that may be selling at premiums on the terminal markets as high quality milling wheat.

SIMPLIFICATION PROGRAM OF CALIFORNIA STATE CHAMBER OF COMMERCE

State Group of California Has Cooperated with Bureau of Standards in Promoting Value of Simplification to Industry

The simplified practice committee of the California State Chamber of Commerce recently reported to the state-wide industrial committee that "The application of simplified practice and elimination of waste has very materially benefited California industry by reducing production and merchandising costs, and supplying the market with more uniform and satisfactory products." This committee recommended that "the State chamber of commerce expand its simplification activities to include other groups that are in need of such benefits, in order that they may better compete in available markets."

Since October, 1929, the California State Chamber of Commerce has served as the contact agency in California for the division of simplified practice of the Bureau of Standards. This arrangement affords a direct avenue through which the use of simplified practice recommendations may be encouraged and suggestions for new projects secured.

This state-wide simplification program has been in operation for more than two years. More than 30 meetings have been held during that period, out of which have developed a number of definite waste elimination projects and which have progressed as a result of active assistance of trade organizations representative of the following professions and industries: Purchasing agents; electrical, founders, and clay products industries; and groups engaged in the study of industrial accidents.

The California State Chamber of Commerce further reports that 80 per cent of the objectives for the year 1931, were attained, and that, as an outgrowth of the general plan, many specific objectives have been established for future attainment by committees appointed for the purpose.

Under the direction of Charles S. Knight, manager of the industrial department of the State chamber, the cooperative simplification movement has developed through the following customary three stages:

1. General education as to the philosophy of simplified practice and the building of interest by local applications of this principle.

2. Acceptance of existing simplified practice recommendations.

3. Initiation of new simplified practice recommendations.

The first stage consists of the writing and publication of articles dealing with simplification and standardization. Speeches are made by industrial leaders and executives of trade associations before conventions, conferences, and other meetings. This promotional work has aroused general interest by showing that simplified practice is an economic principle, the adoption of which results in definite and tangible benefits.

The chamber of commerce has appointed several committees which go further than merely confining their activities to the simplification of materials. They study safety codes, business codes, and other

practices susceptible of simplification. Their initial efforts have necessarily have confined to generalities—educational programs and promotional activities. They are now engaged in certain definite programs.

George L. Eastman of the Fidelity Savings & Loan Association of Los Angeles, is chairman of all simplification committees in the State of California. Charles M. Gunn of the Gunn-Carle Co. of San Francisco is vice chairman. The committees are divided into two major groups known as the northern group and the southern group, each under the immediate guidance of a vice chairman. The following six committees in each group are actively at work:

1. Simplified invoice.
2. (a) Standard specifications and pattern charts for castings.
(b) Standard sales agreement and trade customs.
3. Common brick.
4. Pole line hardware.
5. Structural steel.
6. Uniform building code for California.

Other committees will be formed when opportunity permits.

Each group holds at least two meetings every year, at which time plans are adopted for future procedure and reports are made on actual operations and results. Minutes of these meetings are published and distributed. The committees have been and are now setting and accomplishing definite objectives, with satisfying results. To illustrate, they report:

1. One hundred and twenty-five California firms are using the simplified invoice form.

2. Eighty-two foundries have adopted standard specifications for castings.

3. Eighty foundries have adopted standard patterns for castings.

4. Twenty-nine California manufacturers of common brick have adopted one standard size.

5. Sixteen reinforcing-steel dealers throughout the State have accepted simplified practice recommendation No. 26, Steel Reinforcing Bars.

An example of the initiation of new simplification projects may be cited in the instance of items of pole-line hardware, used by public utility companies principally. Through the activity of a special committee of the Pacific Coast Electrical Association, in cooperation with the simplified practice committee of the California State Chamber of Commerce, the users of pole-line hardware in the State of California have adopted as standard 17 items of pole-line hardware. These 17 items represent approximately 60 per cent of the former variety. Twelve of the former variety have been eliminated and replaced by 3 items, included in the total of 17 mentioned above. A list of approximately 85 items has been reduced to 53, a reduction in variety of 37.6 per cent. A list of 56 standard packages for various items of pole-line hard-

ware has been adopted. The hope is that this work eventually will be recognized on a national scale.

The committee believes that its efforts will place the following benefits within the reach of manufacturers, jobbers, and consumers: Fewer sizes and varieties of raw material and hardware to be manufactured, quicker turnover of stock, less space required for storage, smaller capital investment, greater ease in obtaining materials, quicker delivery, and release of capital for other purposes. The adoption of standard packages should result in easier handling, improved storing conditions, and simplification of inventories. There should also result less need for breaking standard packages to fill small orders, because the adopted standard packages hold a smaller quantity than the former packages.

The California group estimates that this simplification of pole-line hardware, and packages therefor, will result in an annual saving of \$700,000 to the electrical industry of California.

Having summarized the activity of the California group, it is apropos to state that groups in other States are planning similar activity. For instance, the Pennsylvania State Chamber of Commerce has inaugurated a state-wide simplification and elimination of waste program and is now engaged in selecting membership of the various working committees. The advisory committee which is now at work on this program consists of the following: F. W. Walker, Beaver Falls, Pa., chairman; William Mann of the Wm. Mann Co., Philadelphia; C. B. Auel, of the Westinghouse Electric & Manufacturing Co., East Pittsburgh; John A. Longacre, of the American Equipment Co., Norristown, Pa.; E. J. Poole, of the Carpenter Steel Co., Reading, Pa.; and R. K. Laros, of the R. K. Laros Silk Co., Philadelphia.

Groups elsewhere in the United States are studying the potentialities of simplification and standardization, on a state-wide basis, and their possible effect on industries within the State.

SANITARY CODE PROPOSED FOR INDUSTRY

Proper Sanitation and Practice of "Safe" Principles of Personal Hygiene Outlined in Safety Code

By Assistant Surgeon General L. R. THOMPSON, *United States Public Health Service*

For many years industry has carried on a more or less extensive educational campaign along accident-prevention lines. The resulting laws requiring proper safeguarding against preventable accidents and the education of the worker as to his share of responsibility have reduced machine accidents in a marked degree. In fact, reports show that where formerly loss of life and the economic loss from accidents in industry were in some instances greater than the losses from illness, now the reverse is true; namely, the loss of life and economic loss to the workers and industry resulting from preventable illness far exceeds such loss as a result of accident. When this became apparent the same group of "safety men" became interested in the prevention of illness through proper sanitation especially as accomplished by securing "safe" water supply, "safe" excreta disposal, "safe" atmosphere in the workroom free from injurious dust, gases, and excessive heat, and the practice of "safe" principles of personal hygiene. In this sense of the word the proposed industrial code is properly considered a safety code. The Industrial Sanitary Code has been sponsored by the Public Health Service and is being prepared under the auspices and procedure of the American Standards Association. A tentative draft of the code has been furnished the members of the sectional committee. It is hoped that the work of this committee will soon be completed and a code will be made ready for final drafting. When finished this code will furnish what is believed to represent at the present time the best methods and practices in the sanitation of industrial establishments. These rules and regulations will be offered to municipal or State governing bodies for their approval and adoption as a means to secure and enforce sanitation in industry.

The standards as regards efficient sanitation as expressed in this code have been arrived at after con-

sulting various leaders in the following representative groups, including industry, sanitary engineers, industrial medical departments, industrial insurance groups, safety engineers, architects, State and National Departments of Labor, Bureau of Mines, Bureau of Standards, and the Public Health Service.

To attempt to express all the standards in terms effective for all localities would be an impossible task. However, it does, in a broad way, cover all fields of industry, including those temporary and those permanent. Some States may see fit to supplement more stringent rules regarding some portions of the code that would be unnecessary and unreasonable in other locations under different working conditions. The standards set forth are such that with intelligent observance of the rules the employees and community are safeguarded in any locality, and where these standards can not be effected, the industry should not be permitted to carry on. Likewise under some conditions it is reasonable to suspect that more stringent standards are reasonably expected to be maintained and this can be accomplished by the governing bodies further supplementing and modifying these rules. The standards expressed are those considered safe from a health viewpoint and not necessarily to be accepted as the best that can be attained in any instance. We can reasonably expect the proper observance of the rules and regulations in this code to prevent illness among industrial workers and within the community by insuring water supply, proper disposal of waste, efficient ventilation and heating of plants, and education of the worker in matters of personal hygiene.

Should the acceptance of this sanitary code by those properly interested in the welfare of the worker as well as in success of industry be followed by decrease in illness among the group affected, it may correctly be termed a safety code of the first class.

TELEPHONE INDUSTRY

Standardization Steered Toward an Orderly Mode of Progress

By Dr. FRANK B. JEWETT¹

While the above title covers communication broadly, the telephone industry may be chosen as one of the several arts of communication well representing the interdependence of research and standardization.

The telephone itself, as has been stated many times, was born in a research laboratory, and a continuing program of research has been the foundation built upon in the development of the telephone plant and in the expansion of the business. Following the invention of the telephone, those who undertook to develop the new industry were men of vision and imagination who saw clearly that the conditions to be met in such a broad use of the new facility as they foresaw were quite different from those underlying any previous art or industry. From its earliest days the telephone industry has shown on the one hand independence of precedent and on the other hand a keen appreciation of standardization intelligently applied. Care has been taken, therefore, in the telephone industry not to allow standardization to lead to stagnation, but rather to an orderly mode of progress. New standards for old things are being continually evolved, as a result of laboratory research, but these new standards are always tied in with the old.

Standardization has from the beginning of the industry been recognized as peculiarly a necessity in the telephone art. Telephone plants installed anywhere throughout the country must operate or perform efficiently in connection with apparatus installed in any other part of the country. The very intricacy of the switching operations for the rapid connection of any two telephones in the country and the complexity of the electrical transformations to transmit and reproduce speech clearly, resulting in a highly organized and inherently complex system, lead to an effort to avoid the still greater intricacy and complexity which would result if it were not for a high degree of standardization. It is no exaggeration to say that the telephone service of to-day could not be given without this standardization.

In addition to the fact that the inherent nature of the business makes standardization so essential, by this process the best is made available for all. This does not mean that in the telephone industry there may not be a number of standards so chosen as to meet varying conditions and at the same time to furnish best over-all results.

In addition to minimizing the complicated engineering and operating problems which would result from attempts to provide intercommunication between widely divergent systems and with widely divergent apparatus, there are the following rather obvious advantages from standardization: Material costs are reduced when under similar conditions in a large interconnected system all use identical items permitting manufacture in large quantities. Standardization likewise reduces the cost of carrying stocks of material by reducing the number of types required; reduces the

cost of instruction of new employees, because there are fewer things with which to get acquainted; simplifies plant accounting; and of particular advantage in a public service, such as the telephone business, it renders large supplies of material and labor more readily available in emergencies. Past standardization facilitates, not hinders or delays, the prompt and economical introduction of new standard types of apparatus and methods.

Standardization without the knowledge accumulated from well-directed research proceeds haltingly, without any real assurance that in seeking to choose the best medium the whole field of choice has been considered and hidden pitfalls avoided. The telephone art involves the transmission of speech; hence the necessity of knowing in definite terms the characteristics of speech sounds and corresponding speech currents. Having determined the characteristics of normal speech, it is equally important to determine how serious becomes any failure to transmit accurately those speech sounds from talker to listener. This determination also includes the effects of noise upon the circuit or in the room where the listener is located. This leads from a study of speech itself one step further back to a study of the mechanism of speech production and a study of the mechanism of hearing. Research has been actively directed to these subjects particularly during the past 15 years or so, and the results obtained furnish a more definite knowledge of the basic material, namely, speech, with which the art deals.

Having defined, in so far as is possible, in definite physical terms the basic material with the transmission of which the art deals, namely, speech, the next concern involves making available to any two persons who may wish to converse the most effective channel for the conveyance, that is, transmission of their speech. To do this requires the provision of an enormous quantity of physical apparatus, using the term apparatus broadly, and in the choice of this apparatus economical considerations become a recognized factor of great and in many cases, controlling importance. Since, in general, considering portions of the problem, there are several different methods of accomplishing a result, to choose the method which, weighing all the factors, is the best presumes an accurate definition in quantitative terms of all those factors. While one of those factors is defined in economic terms, the other factors are largely defined in physical terms which in the last analysis rest upon the results of research.

As the primary concern in the telephone art is the conveying or transmitting of speech, for which the transmitting channel between the two terminal instruments is by means of either wire or radio or the two combined, it has seemed of prime importance that complete physical or technical data should be derived covering all possible methods of using such transmitting media. An enormous amount of such quantitative data has been secured from laboratory

¹ President, Bell Telephone Laboratories (Inc.).

and field tests covering, for example, loaded and non-loaded open-wire lines, various types of cable construction, loaded and nonloaded, and radio over a wide frequency range. These investigations covered, in general, signaling frequencies, voice frequencies, and carrier frequencies. The availability of this quantitative physical data, together with economic data, has enabled the engineer to choose and standardize the transmitting channels best fitted to meet conditions involved.

Likewise in that phase of the art of telephony involving switching or the process of providing a telephonic path from one person to another with whom he desires to converse, fundamental data, the results of technical research, together with economic considerations, form the basis of the engineer's choice and standardization of the methods to be employed under varying but definitely definable field conditions.

Having spoken of the broader research activities underlying the telephone art, mention may be made of two more or less typical cases selected from many under way.

Magnetic materials, being of very great importance in the telephone art, have been for many years the subject of research. As one result of this work the Bell Telephone Laboratories developed permalloy, a nickel-iron alloy having, as compared with the more familiar magnetic materials, very extraordinary magnetic properties. Applications of this new material in the communication art seemed very possible and further work has led to its use for the loading of submarine telegraph cables, its use in certain telephone apparatus, such as relays, and particularly to its use in compressed powder form in the cores of loading coils. The development and standardization of this type of loading coil has resulted in large savings.

The telephone companies have always been large users of timber for poles, cross arms, conduits, pins, and other items used in the construction of the outside plant. At an early date experience showed that poles, even when selected from species most resistant to fungus attack, such as cedar and chestnut, were, nevertheless, quite vulnerable to decay at the ground line. Other species were available, such as southern yellow pine, which would make desirable poles, except for their tendency to decay rapidly, even in the section above ground, unless some form of preservative was applied. Over 30 years ago investigations were begun

by the Bell system covering the technical and economic aspects involved in the use of poles treated with preservatives to protect them against decay and insect attack. At that period of abundant timber supply small economies, if any, could be expected from the use of pole preservatives, but as time went on, with the depletion of timber supply and the increase in its usage, there was foreseen as has actually developed an economic demand for pole preservation which has fully justified the constantly increasing program of investigation.

An early step undertaken was the collection of data as to the performance of southern yellow-pine poles full-length pressure treated with creosote by processes then commercially available. Also, as the cedar and chestnut supply began to show restrictions, further experiments both in field and laboratory were conducted in the treatments of the butts of these species with creosote by brush or open-tank methods, and still later by the spray method. It is obvious that there are many variations possible in the methods which may be employed in treating pole timbers and in the preservatives used. It therefore became necessary to study the effect of these variations and to try to determine those qualities in the finished product that it would be most desirable to obtain.

By applying laboratory methods, it has been sometimes possible to accelerate the tests so as to reach a decision on the value of a treatment long before it could be determined in the operating plant. As might be expected, many of the apparently promising treatments investigated have proved worthless or unreliable. With research going hand in hand with standardization, it is possible to avoid heavy losses that would result from the wholesale use of untried materials in the plant. Standardization, while gradually changing with our increasing knowledge, has been so employed as to confine operating practice to the use of that which is currently known to be the best and to more accurately define that best.

By our present standardized treatment, cedar and chestnut poles have had from 15 to 20 years added to their average physical life, and the southern yellow-pine pole, which normally could not be expected to give more than a few years' service, can now be employed with assurance of an average physical life well over 30 years.

COATED ABRASIVE PRODUCTS

The simplified practice recommendation covering coated abrasive products, as revised by the standing committee of the industry, has been submitted by the division of simplified practice of the Bureau of Standards to all interests for written acceptance.

On April 11, 1928, a joint conference of representative manufacturers, distributors, and users drafted a simplified practice recommendation for coated abrasive products. Acting on the suggestions of various members of the industry, the standing committee appointed by this general conference worked, with the cooperation of the division of simplified practice of the Bureau of Standards, for several months, by correspondence between its members and the division,

preparing a revised list of coated abrasive products. On September 30, 1931, the chairman of the standing committee notified the Bureau of Standards of the final action of the committee and advised that the revised draft, which includes certain changes they believe will add to the value of the simplification program, should be submitted to the industry.

In the original recommendation the number of sizes and types of coated abrasive products was reduced from 8,000 to 1,976. Under the proposed revision certain changes were made which further reduced that number to 1,949. The revised recommendation will become effective one month after the bureau's formal announcement that the required degree of support has been received.

RADIO BROADCASTING SERVICE STANDARDS

Uniform Standards of Service and Uniform Methods of Measurement Essential to Radio Broadcasting Stations

By C. M. JANSKY, Jr., *Washington, D. C.*

In no field of radio communication is there greater need for the adoption of uniform standards of service and uniform methods of measurement than in the definition and determination of the coverage obtained by radio broadcasting stations. The inherent complexity of the phenomena of radio transmission and the wide differences of opinion which exist among radio listeners with respect to what constitutes service are largely responsible for the difficulties which to date have stood in the way of standardization in this field.

A complete radio-communication system may be considered as composed of three parts: (1) The transmitting station proper, (2) the transmission medium, and (3) the receiving installation. Knowledge concerning the design of radio transmitting and receiving apparatus has progressed immeasurably beyond the knowledge of the transmission medium or the ability to control it. Consequently, consideration of the problems of standardization are immeasurably simplified if attention is confined to conditions as they exist at the receiving location without attempting to express any relationship between conditions at the transmitter and conditions which may be expected at the receiving location. In fact, the vagaries of radio transmission are such that generalized attempts to express coverage and service areas in terms of power and frequency are bound to result in specific cases deviating to such an extent from each other as to render the result highly inaccurate.

The operation of a radio broadcasting transmitter produces at any receiving location a radio-frequency field, the intensity of which may be measured. There are present at any particular receiving location in addition to the field from the desired broadcasting station, other electrical fields capable of producing noises and disturbances in the receiver. Some of these may be referred to as atmospheric (static). Others produced by man-operated electrical machinery are sometimes referred to as inductive interference. There may also be produced at the receiving location electric intensities from radio stations other than the one the listener desires to hear. The presence of these may be referred to as radio interference. (Some years ago some interference due to the operation of regenerative receiving sets was of importance, but this factor may be neglected now.)

It is not absolute value of electric intensity from the desired broadcasting station which is of importance, but the ratio of this intensity to the other disturbances present at the receiving location. This is due to the fact that the sensitivity of modern receiving sets has been carried to a point where weakness of signal is not in itself an important factor in limiting its usefulness.

If attention is confined to the area immediately surrounding a broadcasting station, there will, in gen-

eral, be a decrease in the intensity at the receiving location as the receiving location is moved in a line directly away from the transmitter location. (This does not mean that the rate of falling off will be the same in all directions.) Out to a certain point this falling off of intensity has no effect upon reception except to require different adjustments of the volume control on the receiving set. However, a point will finally be reached at which reception from the desired station is marred by the presence of interfering disturbances from static, inductive interference, or radio interference.

If nighttime conditions are under consideration a fourth factor, fading, may serve to mar reception. As the receiving location is moved to points where the electric intensity from the desired station becomes lower, and lower reception conditions become worse and worse until finally there is no possibility of enjoyment of the program.

There have been numerous grades of broadcast service defined and numerous standards set up for these grades. Also, different engineers have applied different names to these grades. However, there is now a distinct tendency to limit the grades of service to two and to define these as "primary" and "secondary." Since nighttime conditions are sometimes radically different from those in the daytime, it is also becoming common practice to differentiate between night and day conditions. Thus it is common to speak of the "primary nighttime coverage area" and the "primary daytime coverage area" of a station.

Variations in interference conditions and the standards of service imposed by listeners preclude absolutely accurate word definitions of even primary and secondary coverage. However, the following description will serve to show the basis for determining the division line between the two:

The primary coverage area of a station is that area throughout which the station can be received without objectionable interference from static, electrical interfering noises, or interference from other radio broadcasting stations practically all the time the station is in operation. Primary daytime coverage refers to daytime conditions while primary nighttime coverage refers to nighttime conditions.

In an area where several stations deliver primary grade service there will be no tendency for the listener to select the station giving the strongest signal, since for all practical purposes all signals will be equally satisfactory providing they exceed the minimum value necessary for primary grade service. Rather, if several primary grade services are available, the listener's choice will be based entirely on program appeal. The standards for primary coverage are necessarily high and should be considered as such.

Secondary coverage is that coverage obtained by a station which does not meet the high standards set forth for primary coverage. In secondary coverage areas there may be times when static, interference, or fading prevent the fullest enjoyment of programs.

Further progress in the standardization of broadcasting station service areas will rest upon recognition of the following fundamental considerations: (1) Coverage must be determined by a consideration of conditions at receiving locations throughout the area served, (2) coverage can only be determined by an engineering study of field intensities and conditions at the receiving location. It can not be based upon

listener opinion if the results are to possess sufficient accuracy to be of value for comparative purposes, (3) throughout the highest grade coverage area (primary) value of service will in general be independent of the field intensity produced by the station, (4) the differences between night and day time conditions are usually so great that both primary and secondary coverage should be subdivided to show separately night and day conditions, and (5) secondary nighttime coverage can not be shown on an area basis, and any attempts to show even secondary day coverage on an area basis must be made with extreme caution.

GRADING OF HIDES AND SKINS

Tentative Standards Issued by Department of Agriculture

By C. V. WHALIN¹

The U. S. Department of Agriculture, in cooperation with the national hide and leather industries, is conducting a program of domestic hide and skin conservation and improvement. Various agencies in the department specialize in this work according to their respective fields of activity. The livestock, meats, and wool division, of the Bureau of Agricultural Economics, whose duties are in the field of economics, standardization and marketing, is developing standards for the market classes and grades of hides and skins generally referred to by the industry as "raw stocks," while other agencies are working to reduce the wastes and loss due to grubs or warbles, warts, wire scratches, brands, improper flaying, and curing, etc.

This division is preparing standards by which the relative excellence of the product may be equitably measured on the basis of its condition and quality and on which trading may be conducted with fairness to the stockman, hide producer, dealer, and tanner. It also encourages trading according to definite qualities or values as indicated by the market classes and grades recommended in these standards in order that there may be a commensurate reward to those concerned, according to the varying degrees of quality, yield, and usefulness. The objective is to stimulate greater care in the production, preparation, and marketing of these products and, by this means of conservation, add proportionately to the national wealth.

The grades of hides and skins are determined quite largely by the condition, yield, and quality of the leather produced from them under standard tannery conditions. This requires careful research involving elaborate correlation tests, checking the classified and identified raw materials against their leather products in the various tannery process stages to the finished products.

Tentative standard market classes and grades for hides and skins were issued in September, 1928, and distributed to packers, hide dealers, and tanners. Revised tentative standards for kip and calf skins were

issued in January, 1931, and distributed in like manner. These latter standards, while subject to change if experience indicates changes to be desirable, have demonstrated their usefulness in connection with the kip and calf skin conservation program, particularly in cases where their requirements and recommendations have been faithfully followed in the flaying, curing, sorting, and marketing operations.

Greater care in the production, preparation, and handling of American raw stocks is essential to accomplish the degree of conservation desired. Importations of the qualities of raw stocks required by tanners have been relatively heavy, while many of the domestic skins apparently have been neglected. This is especially true of skins produced in small quantities and at irregular intervals by those who either are inexperienced in efficient skinning, curing, and marketing practices or who lack the facilities for following the proper methods. It is believed that a simple system of standards if properly used will provide a measuring stick by which defects and improvements may be correctly appraised and by which the raw stock producer may register his progress in conservation and market his products according to their value. It is further believed that this will stimulate a sustained effort at hide and skin conservation and create a broader demand for the improved domestic products. The livestock, meats, and wool division has endeavored to provide the measuring stick—the standards by which progress in conservation may be registered and by which relative values may be rewarded by corresponding market prices.

Another service rendered by the division to the hide and leather industries is that of collecting and compiling basic data by which estimates of the number of domestic hides and skins produced annually may be made. This estimate is based on the actual and estimated slaughter of hide and skin bearing animals in connection with its estimates of annual production and per capita consumption of meats. The basic figures in both cases are the same and are compiled after patient research and careful calculation.

¹ Principal marketing specialist, Bureau of Agricultural Economics, U. S. Department of Agriculture.

AMERICAN STANDARDS ASSOCIATION

Association Activity During January

The following current information concerning developments in standardization projects under the auspices and procedures of the American Standards Association, has been furnished by that association:

Pipe flanges and fittings.—The association has approved an American standard for cast-iron pipe flanges and flanged fittings for maximum nonshock working hydraulic pressure of 800 pounds per square inch (gage) at ordinary air temperatures. The standard, which is the eighth one so far developed by the sectional committee on pipe flanges and fittings, gives three tables listing the facing dimensions, the center-to-contact-surface dimensions, and the center-to-flange-edge dimensions in so far as these apply to elbows, tees, crosses, 45° ells, laterals, and reducers, for nominal pipe sizes from 2 to 12 inches, inclusive. The committee was sponsored by the American Society of Mechanical Engineers, the Manufacturers' Standardization Society of the Valve and Fittings Industry, and the National Heating and Piping Contractors' Association.

Manhole frames and covers.—A proposal for an American standard for manhole frames and covers containing recommendations for 13 types of frames and 7 types of covers to replace the thousands of types now in use has just been published by the American Standards Association. The demand for innumerable different designs and sizes of openings for manholes by the various utilities and municipal supply departments which make separate or joint use of manholes for their underground pipes and lines has caused many difficulties in manufacture and replacement of manhole frames and covers. The present concerted effort to standardize on a few sizes and styles is the result of these difficulties. Since 1924 a technical committee has been working on the subject under the procedure of the American Standards Association, going through a long process of elimination, selection, and redesign.

The number of utilities concerned with manholes is indicated by a list of the organizations which have been working on the formulation of the standard through representatives on the committee. These organizations include the American Electric Railway Association, the American Gas Association, the American Railway Association, the American Society of Municipal Engineers, the American Water Works Association, the Bell Telephone System and the United States Independent Telephone Association, the National Electric Light Association, the Western Union Telegraph Co., and the Postal Telegraph-Cable Co. The American Society of Civil Engineers and the American Standards Association telephone group have been acting as joint sponsors for the project.

The committee is now circulating a questionnaire to all those concerned with the production and use of manhole frames and covers to determine whether producers and users find the recommendations satisfactory or whether they wish to make suggestions for changes.

The proposed standard includes drawings showing designs and dimensions for the 13 types of manhole frames and the 7 types of manhole covers which are recommended. It is believed that this limited number of frames and covers will meet the present requirements of the various utilities concerned.

The draft also includes specifications for hydrant and service valve boxes. Specifications are given for the gray-iron and carbon-steel castings to be used in the manufacture of manhole frames, covers, and boxes. Standard methods of test are provided by which both manufacturers and purchasers can determine compliance with the specifications. Following are the types of manhole frames for which standards are proposed: Straight-type round base, flared-type round base, flared-type square base (height 10 inches), flared-type round base (shallow), flared-type square base (shallow), flared-type square base (height 7 inches), flared-type square base (light weight), straight-type square base, straight-type round base (for inner cover), straight-type square base (for inner cover), straight-type round base (shallow, flange midway between top and bottom—for inner cover), straight-type square base (shallow, flange midway between top and bottom—for inner cover), and shallow ring.

Sieves for testing purposes.—The sectional committee on sieves for testing purposes has agreed upon the following scope as suitable for the project: Specifications for sieves (screens) for testing purposes, including nominal dimensions, tolerances, designation, and methods of verification, also methods for reporting results of sieving. It is expected that this scope and the membership of the committee will shortly be submitted to the association for approval. It has been decided by the committee that subcommittees should be set up to investigate the possibility of developing tentative specifications on the following:

- (1) Coarse sieves (square mesh and round holes, if both are found necessary);
- (2) fine sieves;
- (3) pigments or other materials requiring special attention;
- (4) the presentation of data; and
- (5) the calibration of sieves.

The committee further recommended that L. V. Judson, of the Bureau of Standards, who is serving as secretary of the committee, be designated as the American representative on the International Standards Association committee on unification of sieves for testing purposes on an international basis. The sectional committee as representatives of American technology will participate in the discussions of the international committee.

Electrical standards committee.—The July, 1931, Commercial Standards Monthly contained an account of the organization of the electrical standards committee under the auspices of the American Standards Association. The committee was created for the purpose of unifying the standardization activities of the electrical industry. The personnel of the electrical

standards committee were to constitute the major part of the personnel of the United States National Committee of the International Electrotechnical Commission after reorganization of the national committee. At a meeting of the latter group held in New York on December 1, 1931, Dr. Clayton H. Sharp, of the Electrical Testing Laboratories, was unanimously re-elected president; Charles Rufus Harte, chairman of the electrical standards committee, was elected vice president; and Dr. H. S. Osborne, American Tele-

phone & Telegraph Co., was reelected secretary. The December 1 meeting of the United States National Committee of the International Electrotechnical Commission was the first to be held by the new committee as constituted in the recently approved constitution of the electrical standards committee. The new committee consists of the members of the electrical standards committee, nine members at large, and three representatives of the American Society of Mechanical Engineers.

WESTERN UNION OFFICE SUPPLIES ARE STANDARD

Company Began Its Standardization Work on Office Supplies 17 Years Ago

By W. G. HIGGINS

Seventeen years ago our company set about to adopt certain standards for forms and office supplies. A committee was appointed to study this question. The committee was composed of one representative from each operating vice president's office, the departments thus represented being engineering, plant, commercial, traffic, and accounting. The writer was appointed chairman of the committee in question.

The committee was created for the purpose of standardizing on printing, printed forms, paper, office and janitor supplies, office equipment and furniture, and to produce a suitable catalogue for the guidance of the various departments in the ordering of such supplies. Its policy has been, so far as practicable, to select commercial grades of supplies and avoid the necessity and expense, of special or specification materials.

The committee first went to work on printed forms. Our warehouses were crowded with forms of all sorts, shapes, and sizes—about 2,000 of them. Investigation as to the necessity of each form resulted in eliminating one-third of them entirely.

"What quality of paper ought to be used" was the first question asked regarding the remainder of the forms. As a result of a study on this phase of selection of forms, the kinds of paper were reduced from 37 to 11. Corresponding changes in weights were made. To a large extent a standard manila paper is now used. However, the change was not always in favor of a cheaper grade of paper. We considered carefully the purpose each form was to serve.

The committee met weekly for the first year, 1913-14, and working in virgin soil, made savings of about \$39,400 in changing grades of paper on forms and plain sheets, changing from closed to window-type message envelopes, standardizing carbon paper, typewriter ribbons, pencils, ink, copy book, paste, erasers, onion-skin paper, brooms, towels, and so on, and by eliminating about 600 forms entirely.

During this same period it worked out a new basis for consolidating the printing into one central contract, in which the printer was protected from loss due to obsolete firms by authority from us to print certain units and to carry certain stocks which we guaranteed to take.

In 1914 the purchasing department made a 3-year contract for printed forms, and the printers, with

definite standards at hand for the various papers used, purchased their full three years' requirements. This resulted in the saving of several hundred thousand dollars during the three years following.

Subsequent standardizations have produced savings of about \$85,000, principally from further changes in weights and kinds of paper, the further elimination of unnecessary forms, a change from cheese cloth to dust cloths and wiping rags, and economies in connection with the use of miscellaneous office supplies. Naturally, conditions, changes and all savings do not repeat through the years, but many have been of an enduring annual nature.

All supplies are ordered by the operating divisions from main supply warehouses at New York, Chicago, and Atlanta. Any orders for items of nonstandard material from any of these warehouses are sent to me for approval, as chairman, and clearing house for the committee. The chairman then sends the request for approval or rejection to one or more of the representatives within whose departmental jurisdiction the request falls. Thus the committee keeps close record of the extent to which it is necessary to deviate from standards.

Nearly all new forms now proposed emanate from the committee representative in an operating vice president's office, assisted by a man in my office who is an expert in arranging forms for printing.

Of later years the committee's work has been so thoroughly organized, that while in the beginning it met regularly it meets now only on call of the chairman. However, there is a constant exchange of memoranda on various suggested changes and improvements. Naturally, the field of exploration has been materially narrowed, but new and satisfying savings are made each year and the committee decidedly justifies its existence. Existing standards are regularly test checked, and new possibilities are investigated through testing in our engineering laboratory and by trial in actual use. Samples of a number of such standardized articles are on view in the office of the chairman of the committee, and at each warehouse, in order that materials received and disbursed may be in accord with the standard.

A spirit of steady cooperation is, of course, essential to the proper working of any committee appointed to work out such problems, and we have been fortunate in this respect.

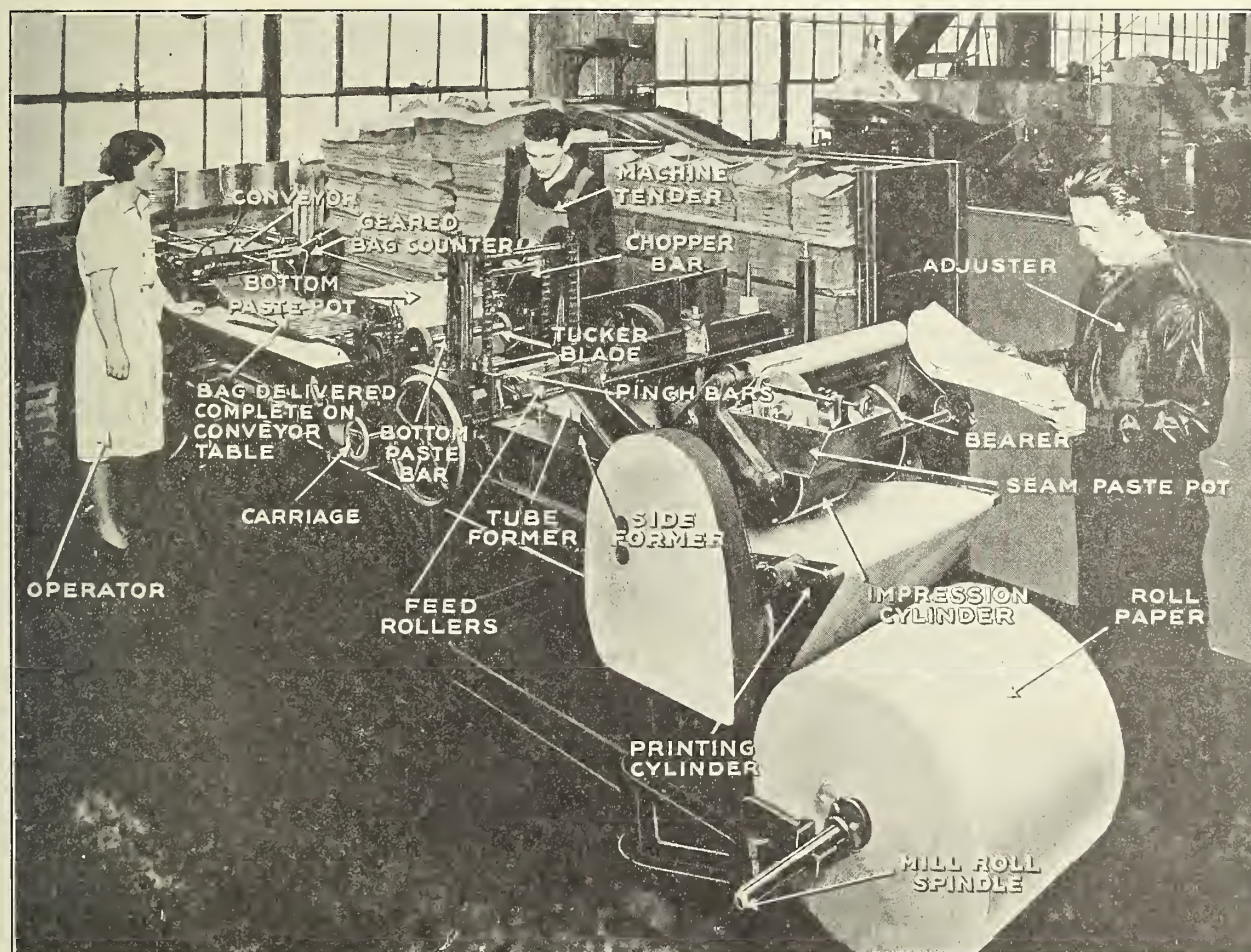
ECONOMIES IN STORE WRAPPING AND PACKING

Simplification of Existing Sizes of Paper Bags, Folding Boxes, Set-Up Boxes, and Corrugated Boxes Will Tend to Reduce Costs of This Part of Stores' Overhead Expenses

By MAURICE ROSENFELD, *President Equitable Paper Bag Co. (Inc.)*

Statistics will, it is believed, indicate that the number of department-store transactions has increased during the past year. Yet, while sales volume has unquestionably declined, operating expenses have

Many will recall that very recently the simplification and standardization program was accepted by the manufacturers and users, and was promulgated through the division of simplified practice, Bureau of



Procedure of machine's function in bag making

shown no appreciable variation. If anything, because of these increased transactions, operating expenses have become higher.

With the possible exception of set-up and corrugated box manufacturers, I, as a paper bag, envelope, and sack manufacturer, can not state the ideas and opinions of others. However, I am convinced that in my industry a remedy exists which will enable department stores to minimize these maintenance costs, and by that token, bring them to a more reasonable proportion with sales volume. An adoption of the program designed to simplify and standardize the department-store use of paper bags, folding boxes, set-up boxes, and corrugated boxes is the remedy to which I refer.

Standards, and the National Retail Dry Goods Association. Although it is true that both of these latter organizations dealt assiduously with the subject matter and thereby obtained an intimate knowledge of the problems of both the bag and box manufacturer and the department store, it is entirely conceivable that many manufacturing policies and difficulties, perforce, had to be dealt with rather hypothetically. To clarify any doubts or ambiguities which may exist, let me submit a more intimate explanation of the economies we manufacturers will be able to achieve and pass on, if the department stores will adhere to this new simplification program.

In the United States there are approximately 6,000 department stores, representing a yearly consumption

of about 3,000,000,000 bags. The survey by the Department of Commerce revealed that these stores use approximately 188 different sizes. By the adoption of the new simplified practice recommendations these sizes have been reduced to 28. Although much has been said concerning the merit of mass production, there is no doubting the fact that in my industry it is the one system of operation that will make prices lower. Moreover, when it is considered that the manufacture of each size of bag necessitates certain time-consuming machine-changing operations, it will readily be seen that in order that we may be able to bring about production economies we must reduce these machine changes to a minimum.

After all, mass production is not an unscientific production on a large scale. Instead, it represents a well-formulated plan of manufacture at the lowest possible cost. Therefore, to point out the tremendous importance in terms of mass production, attached to the adoption of the standardized and simplified sizes, let me give you a description of the procedure generally necessary for the making of a complete change of bag size. I say "generally" advisedly, because this process would vary slightly, depending upon the make or type of machine employed.

Let us assume that the machine (see illustration) has just completed an order calling for an 8½ by 11½ inch big-lip printed notion bag, and that we now want to fill an order calling for an 8 by 11 inch printed big-lip bag. (It should be noted, incidentally, that this changing operation is necessary even though the size differential between an 8 by 11 and an 8½ by 11½ is slight.)

The adjuster removes the former, big-lip knife, bottom paste bar, change gear, electro printing and impression cylinder, bearers, gears, and mill-roll spindle out of the machine, cleans them, and returns them to the equipment rack. If a different color of ink is required, he clears the ink fountain and rollers.

A new former, centered and leveled, is inserted, and advanced or retarded, as the situation requires, to achieve the proper distance from the chopper bar. It is then clamped tight. The lip knife is put in and set properly in relation to the former head and side formers, and guides are adjusted. The change gear is placed into position, fastened, and properly meshed with an intermediate gear. The proper paste bar is put in and set at a distance from tucker blade to suit the bag bottom. The bar or paste pot is adjusted, so that the bar will pick up the correct amount of paste. We are now ready to put the mill-roll spindle through the new roll of paper, center it in the machine, and adjust the tension of the brake.

Paper is threaded through the machine, feed rollers are adjusted to pull up a good tube, pinch bars and choppers are adjusted to insure a good cut-off, the carriage is moved in or out to make a proper bottom and exact bag length, and then deliver rollers are set to pinch the bottom edge of the bag. From the machine the bag goes into a conveyer which is regulated so that bags deliver properly. After the counter or kicker is adjusted and timed, we have completed the operation necessary to procure a plain bag.

We next direct our attention to the printer.

Proper printing and impression cylinder bearers and gears are put in. The electroplate is mounted on the printing cylinder. A new tympan is placed upon

the impression cylinder and adjusted for proper impression. The fountain is flushed with ink, composition rollers are placed into position and adjusted for proper printing reproduction.

The paper is again threaded through the machine and imprint is placed in proper position upon the bag. A bag is then brought to the check inspector to be checked for size, print, flap, paper, etc. If every detail is found to be correct, it is O. K'd and manufacture begins.

When it is realized that these paper bags are made right from a roll of paper, the bags being printed, formed, seam pasted, cut off, bottom formed and pasted, delivered, and counted, all in one operation at the rate of 150 to 250 per minute, it can readily be understood that the machine must not only be a fairly large and complicated piece of machinery but one which requires constant surveillance. To run such a machine, it is required that an operator, a machine tender, and an adjuster be in constant attendance. (The adjuster usually has control of a battery of five or six machines, and is the person who makes the enumerated changes.)

Sometimes the changing operation is effected very rapidly. At other times something may occur to delay it. Usually it takes from two to five hours, during which time the machine tender and the operator are idle, so that actually for every changing operation the time and labor of three persons are involved, the adjuster, the machine tender, and the operator.

By checking up on daily production slips, we have found that each machine change results in daily production utility loss. An example should indicate this point more clearly. Ordinarily, size 6¼ by 9¼ should be produced at or about the rate of 100,000 per day. On the basis of 225 working days, yearly production should then be 22,500,000. Our records, however, indicate an actual production of 18,987,000 of this size—a below par discrepancy of 3,513,000, or 15.6 per cent. Inasmuch as the mere changing of the roll of paper is a speedy operation, this production loss is due entirely to the fact that we were called upon to alter the machine for the accommodation of a slightly larger or slightly smaller size. Could we, therefore, be assured that each machine would be concentrated exclusively upon the production of one size, the 15.6 per cent production loss would be eliminated and our prices would be proportionately lower. Even though every manufacturer strives to do exactly that, the inordinate number of sizes prevalent makes it an impossibility to do so. Some may say, "Well, why not obtain more machines?" When it is realized that the installation of every new machine requires (1) an initial investment for its purchase, (2) the purchase of power units (motor and variable speed control), (3) added floor space, (4) added workers, (5) installation cost (machines lined up, leveled up, and wired up), and (6) the use of more electric power, it will be recognized, since prices must keep pace with increased overhead, that nothing will be gained. A universal adoption of the 28 suggested sizes, however, will enable us, as it will other manufacturers, undoubtedly, to maintain not one but two machines for the steady production of one size—all of which is indeed a far cry from actually being compelled to purchase additional equipment.

Aside from this major production loss, since the adjuster must also give his attention to the other machines under his control, there is very often a loss in connection with those neglected.

Equally as important as that of the manufacturing change itself is the problem which concerns itself with the amount of paper we are required to stock in order to swiftly facilitate the execution of incoming specifications. With 188 different sizes of bags being used in the United States and with each roll of paper varying with the bag size to be produced, it is understandable that vast warehouse facilities must be maintained. It therefore requires little deliberation to visualize the fact that a concentration upon the 28 suggested sizes will permit us to make infinitely more favorable group purchases, and to release warehouse space for other valuable purposes.

These few explanatory words, we trust, will serve to clear up the last vestige of uncertainty which may

exist, and bring to department-store operators a sounder knowledge of our problems and of our manufacturing limitations. Inasmuch as we can not readjust our price schedule on mere conjecture, nor would anyone, I am sure, expect us to adopt such an impractical measure, it is urged that department stores accept the standardization and simplification proposal at once. This is imperative, because manufacturers can do nothing until they are assured of a full 100 per cent cooperation.

Recently the store manager's division of the National Retail Dry Goods Association published a booklet on the simplification of wrapping and packing supplies, which explains this project in detail. Attached to this booklet is a blank form on which the reader may indicate his acceptance of the recommendations. Many, undoubtedly, have this in their possession. Those who have not may apply to the National Retail Dry Goods Association.

UNIFORM CONTROL OF ASSIGNED RADIO-FREQUENCY

Broadcasters Prepare to Meet Federal Radio Commission's New Ruling on Frequency Control

Broadcasters throughout the country are preparing to meet the requirements of the Federal Radio Commission's new frequency-control ruling, effective June 22, 1932, which will clear the air of much objectionable interference and accomplish the equivalent of increasing the power and service area of every regional and local station in the United States.

Regional and local stations (those not operating on cleared channels) in every part of the country are installing frequency checking and controlling devices, which will enable them to keep their transmitters operating almost exactly on their assigned frequencies.

The new regulation, contained in General Order No. 116, adopted by the commission June 22, 1931, and effective one year from that date, provides that all broadcasting stations shall maintain their assigned frequency between the limits of 50 cycles above or below that channel allocated to them. That is, a station operating on 650 kilocycles, for example, must maintain a frequency during operation between 650,050 and 649,950 cycles.

Under the present law a 500-cycle deviation from the assigned frequency is allowed. This means that under the present law the station's frequency may change as much as 1 kilocycle but the new regulation limits this permissible change to one-tenth kilocycle. The new law is outlined in paragraphs 144, 145, 146, 147, and 148 of the commission's recently published Rules and Regulations.

The commission has made arrangements with the Bureau of Standards to make type tests of frequency-checking devices placed on the market by manufacturers, to see that these devices conform with commission requirements. Broadcasting stations may install any approved device and by means of it check their frequency variation. These devices are being installed now by many stations, so that if they find it necessary to make any changes in equipment to meet requirements of the new rule, they will have op-

portunity to do so before June 22, 1932. The commission believes, however, that changes in equipment will be necessary in only a few stations. By checking carefully with an approved device, commission engineers say, it is possible to maintain the frequency of almost any transmitter within the stipulated limits.

If a station finds it can not maintain its transmitted frequency sufficiently steady, an automatic frequency-control device may be installed, assuring maintenance of frequency. The commission has received a number of applications asking permission to install such equipment. Most stations, however, are finding that new apparatus is not needed.

Engineers who have studied the possible effect of application of the new ruling believe that it will improve reception to a greater degree than any step yet taken in this field. The annual report of the commission called the new regulation a "recognition of the greatest technical advancement in the broadcast transmitter art in recent years." Too great a deviation from frequency brings about what is known as "heterodyne" interference. All radio listeners are familiar with the results of such interference, which sometimes mar the finest programs.

With frequencies of all stations maintained within the 100-cycle limit, the majority of this heterodyne interference will be eliminated. Also, maintenance of frequency, engineers point out, will amount to the same thing as increasing the power and service area of each station under even the most unfavorable conditions.

The Radio Division of the Department of Commerce will report to the commission all violations of the law after it goes into effect. Any station not maintaining its assigned frequency within the stipulated limits will have its application for renewal of license set for hearing.

REDUCING MINE EXPLOSIONS

Electrical Apparatus for Mines Tested to Reduce Hazard from Explosions

By A. C. FIELDNER and ALDEN H. EMERY¹

Have you ever pulled an electric plug from its socket in a dark room and seen a brief flash of flame? Perhaps at night you have watched sparks jump from the trolley pole of a street car to the trolley wire whenever the two were slightly separated. If so, you realize that from the use of electricity in coal mines you have a possible source for the ignition of flammable or explosive mixtures of gas or coal dust and air which may inadvertently be present in the atmosphere of any mine. It is known that electric sparks have ignited such mixtures and caused tremendous explosions, which have resulted in the wholesale destruction of life and property. The elimination of the sources of ignition of such mixtures is therefore of paramount importance.

There was a time when the miner dug coal from the ground with a pick; now he manipulates a huge electrical machine which does the work for him. Until recently, men loaded the coal by hand into cars; now many mines rely on electric loading machines. Once horses and mules pulled the little cars full of coal; now trains of large cars are made up and hauled by electric locomotives.

Most operations within some modern mines are as thoroughly mechanized as those in an up-to-date factory. The machines are usually driven by electricity, and with the increase of electrical equipment has come an increased danger of electrical ignition of explosive mixtures present in the atmosphere. Modern efficiency demands these tools; we can not eliminate electricity from mines, therefore we must take steps to make it harmless.

From its establishment in 1910, the Bureau of Mines has been continuously engaged in a study of the proper design of electrical equipment to minimize this hazard. At present, 13 trained engineers determine whether the various machines, voluntarily submitted by the manufacturers, meet a minimum standard of safety. Not only are the detailed drawings studied to determine whether the method of assembly is fundamentally safe, but the equipment is minutely examined and eventually tested in a gallery containing an explosive atmosphere. Here, 15 to 50 tests are made on the dangerous component parts of a large assembly, trained observers watching for any sign of failure.

If electrical equipment meets these stringent tests it is designated as permissible for use in gassy or dusty coal mines, and the manufacturer is allowed to attach an approval plate bearing the seal of the Bu-

reau of Mines to duplicates of the machine tested. Approximately 400,000 pieces of apparatus bearing the approval plate of the Bureau of Mines are in use to-day, thus considerably reducing the hazards attendant upon coal mining.

In the development of these standards, many laboratory experiments are conducted. For example, the bureau's approval system recently has been extended to cover electric cables. These cables are subject to varied abuses in mines. Tests were developed to show their resistance to bending, abrasion, stretching, and smashing under car wheels. It was found that cables were being constructed which could be bent 5,000 times or run over 20 times by a loaded mine car weighing $7\frac{1}{4}$ tons without failure. Such durability was not general when the first tests were made, but since the attention of cable manufacturers was called to existing weaknesses they have improved their product.

Fundamental work of a related nature has been conducted. This has included a study of the ease of ignition of gas mixture, ignition by heated surfaces, flame propagation, and other factors.

Spectacular as are those mine catastrophes which wipe out lives in a wholesale fashion, they are not responsible for as many fatalities as the day-to-day falling of rock in a mine. Because only one, two, or a few men are killed at a time, accidents of this type escape attention, although their aggregate effects are more disastrous than explosions. An average of $3\frac{1}{2}$ lives are lost each day in our 6,000 coal mines from this cause alone. The Bureau of Mines has therefore undertaken a study of methods for the reduction of this hazard. Although it is too early to evaluate the results achieved, it is believed that practices are definitely being improved.

Seven hundred men caught underground by mine fires or explosions owe their lives to the prompt erection of barricades. Many of these were constructed in accordance with Bureau of Mines recommendations based on a study of hundreds of such accidents. This is only one example of the conservation of life resulting from the extended investigation of mine explosions by this bureau.

Other investigations have included a study of the treatment of mine timber, causes of mine fires, methods of underground loading, and other similar studies.

The safety division of the Bureau of Mines also maintains at the Pittsburgh Experiment Station an office, a laboratory for testing breathing apparatus, and a safety station for the training of men in the mineral industries in first-aid and mine-rescue work.

¹ Engineer and assistant to engineer, division of experiment stations, U. S. Bureau of Mines.

MOP STICKS

On January 15, 1932 a circular letter from the division of trade standards to interested contacts announced the reaffirmation of the commercial standard for Mop Sticks to October 15, 1932.

The survey of adherence to this standard, upon which the opinion of the standing committee was based, indicated adherence of 92 per cent, based on the unweighted averages of 10 large manufacturers of this commodity.

STANDARDS FOR MACHINED SURFACES

System of Reference Samples Proposed as Basis for Standards

By ROBERT COREY DEALE, *Stevenson, Jordan & Harrison, New York, N. Y.*

In every machine shop there is always a question as to just how good a finish is necessary on any surface of a machined part. This is particularly true in a shop run on a jobbing basis, where no part is made in any great quantity, and where a mechanic, in the course of a week, may have a number of different parts to make. As a result, he frequently does not know just how the part fits into its mechanism, and even more frequently is uncertain as to the grade of finish necessary on each of its surfaces.

Because of this condition, a loss of time, and so an extra cost, is almost certain to occur. There are several courses of action open to a mechanic when he is given a part to machine for the first time.

1. To prevent criticism, he may use a high grade of finish all over the part. This is particularly apt to be the case when the workman is paid by an hourly rate, with no form of incentive for production. As few parts require a high finish on all surfaces, this results in an excessive machining cost.

2. The mechanic may go to the foreman for information. It is difficult for the foreman of a machining department to keep clearly in mind the surface requirements of all parts. As a result, he is apt to require better finishes than are necessary, in order to protect himself, although he probably is more nearly correct than the workman. In any case there is a loss of time while the mechanic is securing the information. In addition, the fact that the information is verbal may lead to a disagreement later, either with foreman or inspector.

3. The mechanic, or foreman, may go to the designer for information as to what is necessary. Time is particularly apt to be lost in this way the first time a part is made.

4. The mechanic, or foreman, may go to the assembly floor to study a completed mechanism or machine, should one be available. A single trip of this sort may take a very appreciable amount of time, as it is seldom that it does not include a certain amount of visiting.

5. After a part has been made, the workman and foreman, or workman and inspector, may disagree as to the quality of finish necessary. As a result considerable time is certain to be lost, and the parts already made may be scrapped, although the matter may be carried to the engineering department for final decision, which at the best results in further loss of time.

For the above reasons it seemed highly desirable to standardize the grade of machining finishes used in the plant of a manufacturer of precision machine tools, and to find some manner of indicating on the drawing just what grade of surface was required. It was felt that the designer was in a better position than any one else to decide just what was necessary. In case it seemed desirable to make a change, it could be simply done, and the drawing would then remain the last word as to the part, in dimensions, material, tolerances, and finish.

After a study of the shop had brought out the great loss of time caused by the lack of any method of specifying the degree of surface finish, the system described below was worked out. It has now been in operation for a year and a half, and has proved to be a simple and practical way of avoiding this loss of time, and of making certain that parts made at different times are identical as to finish. It has also been used with complete success in a large repair shop.

The first step was to determine the number of grades of finish necessary to cover all parts that were apt to be made, and to insure that little unnecessary time should be spent on a piece. Conferences with representatives of the engineering, production, and inspection departments brought out the fact that three grades of surface, as produced by a cutting tool, would be ample. In addition, it was decided to list three grades of grinding finish for machinery manufacture, with an additional three that would be used when unusual quality of surface was necessary, as on the rolls used for making tin and aluminum foil.

The three grades agreed on were to include a rough finish, that would be used only for clearances, and similar places where it was only necessary to remove metal; a high-grade finish, which would be used for surfaces running or sliding on each other; and an intermediate finish, termed "commercial" for convenience, which could be used on such parts as bolts or parts that were fastened permanently to some other.

A series of samples were machined, one set of three for each type of cutting tool, using the speeds and feeds that would be used in ordinary shop practice. These samples were criticized by the heads of the production, engineering, inspection, tool engineering, and other methods departments, and new samples machined in accordance with their criticisms.

After samples had finally been produced that were satisfactory to every one concerned, several duplicate sets were made up. Complete sets were placed in cabinets in the engineering and inspection departments, while each shop department was given samples of such types of finish as they were engaged in duplicating. These samples were as follows:

1. Turning (on lathes or boring mills): (a) High finish—for journals, etc.; (b) commercial finish—used for press fits, bolts, portions of shafts, rough fits, etc.; (c) rough finish—used where it is necessary only to remove stock for clearance or to put part in balance.

2. Cut-off: (a) Shaved end—used whenever it is desirable to have highly finished end on shaft; (b) plain cut-off—made with ordinary cut-off tool and showing remains of tit—used where appearance is not important.

3. Thread cutting: (a) High finish—for all precision screws; (b) commercial finish—for bolts, or for rough screws transmitting motion at low speeds.

4. Boring: (a) High finish—used for bearings or similar surfaces; (b) commercial finish—may be used where mating surfaces are used only for the purpose of location; (c) rough finish—used where stock is

removed only to provide clearance or to put part in balance.

5. Grinding: (The mirror finishes used for rolls, etc., are not listed. Where used they should be standardized.) (a) High finish—used for bearings, either for rotating or sliding members; (b) commercial finish—used for force fits; (c) rough finish—usually used for truing up hardened pieces where surface is not used.

6. Planing and shaping: (a) High finish—used for bearing surfaces; (b) commercial finish—used for surfaces bolted permanently together; (c) rough finish—used to remove stock for clearance.

7. Side milling: (a) High finish—used for bearing surfaces; (b) commercial finish—used for surfaces bolted permanently together; (c) rough finish—used to remove stock for clearance.

8. Face milling: (a) High finish—used for bearing surfaces; (b) commercial finish—used for surfaces bolted permanently together; (c) rough finish—used to remove stock for clearance.

9. Drilling and reaming: (a) Reamed hole—used wherever close fit is necessary; (b) drilled hole—used for clearances, as bolt holes.

10. Keyway cutting: (a) High finish—accurately fitting key, or slide key; (b) commercial finish—unimportant key, not transmitting heavy load.

11. Polishing: (a) High finish—used for appearance, as on handles and hand wheels.

12. Lapping: (a) High finish; (b) commercial finish.

To indicate these finishes on a drawing, some simple, unmistakable symbol system is necessary. Those following, which are in part taken from those used in Germany and Sweden, seem to fill the need adequately:

- ▼ Rough finish (any machine).
- ▼▼ Commercial finish (any machine).
- ▼▼▼ High finish (any machine).
- The rough unfinished surface of a casting or forging.
- Surface chipped or filed to size.
- Surface scraped to fit.

The connecting rod illustrated shows just how these symbols would be used on a drawing. As can be seen from this drawing, the symbols are clearer and easier to read than the commonly used "f" and in addition give much more information without cumbering the drawing with notes. It is intended that the ● symbol, denoting a rough, unfinished surface, shall be

used only when it is necessary for clearness. Ordinarily an unfinished surface of a casting would be self-evident with marking.

The foregoing series have the merit of not requiring the engineering department to specify anything regarding the machining of a surface other than its final appearance, unless grinding or lapping are necessary. These may best be indicated by separate dimension lines, bearing an appropriate notation, for the turning, rough grinding, finish grinding, and lapping dimensions.

Specifications of machined surfaces, as outlined previously, may be set up in any shop, either small or large, at a very moderate cost, provided that they go into effect at the start only on new parts. A procedure may be set up whereby no print may be issued to the shop until it has been checked to make certain that the finishes have been specified. Within a short time all active drawings would thus have been changed over, without the necessity of touching any inactive drawing.

In time, it will unquestionably be desirable to have national or international standards of finish, so that a part machined in one shop will fit without difficulty into an assembly made in a second shop. To secure such a standard, it will be necessary for a general method of specifying them. This can be done by specifying the depth of the tool marks, as measured by some form of comparator, together with a tolerance for each class of finish.

To recapitulate, it is believed that the advantages to the average machine shop from the specification of machined surfaces would be comparable to those resulting from the use of tolerance, which are generally conceded. In addition, it would be possible to introduce such standards in the individual shop, by the method indicated, much more readily, and at a much lower cost, than was the case with tolerances. Should a national standard be set up it would greatly facilitate the production of parts in a shop other than the one in which they were designed—a practice which is becoming increasingly more prevalent. A company having no shop at all may design a machine and send it out to a jobbing shop with some assurance that the finish will be as expected, while one with a shop may do the same when its facilities are overcrowded. A national standard would be of particular importance for ordnance, which, in time of emergency, may have to be done in any shop in the country.

STAPLE PORCELAIN PLUMBING FIXTURES

The commercial standard for Staple Porcelain (All-Clay) Plumbing Fixtures, CS4-29, has been reaffirmed, without change, for another year beginning July 1, 1932, or until authorized revisions are duly indorsed by the industry. This action was taken upon the recommendation of the standing committee after considering the results of an adherence survey undertaken in cooperation with the manufacturers of porcelain (all-clay) plumbing fixtures.

The report, summarizing the results of the survey, was based on six replies out of only eight manufacturers in this field. The average unweighted adherence to standard regular selection grade was 95.8 per

cent. Two manufacturers reported that no culls were sold by them; three reported that all culls were marked in accordance with the rules, and one reported that 50 per cent of culls were so marked. The average unweighted adherence to standard types and sizes (both grades) was 91.6 per cent.

Deviations from the standard were reported, due to demand from purchasers for a few nonstandard items, and for several old items for replacement.

No suggestions were offered for the improvement of the standard. Actual direct benefits from the establishment of the standard were reported by all manufacturers who replied to the adherence survey questionnaire. Further details are made available in the report.

GAGING CALIFORNIA PRODUCE BY FEDERAL STANDARDS

Optional Use of Grades Generally Applied Throughout State to Perishable Vegetables and Fruits

By H. W. PETERSON¹

The development of standard specifications for perishable products has been one of the important projects of the United States Department of Agriculture for the past 15 years. Since most of these standards apply directly to California commodities, the California Department of Agriculture has taken an important and active part in the promulgation of a number of these grades.

These standards are known as United States grades. At the present time there are specifications on about 70 commodities. Most of these apply to fresh fruits and vegetables, but several apply to such products as peanuts, honey, and also to crops raised for commercial cannery purposes; for example, cannery tomatoes and spinach.

California's crops are very diverse, and it is interesting to observe that 48 of these grades are used on commodities grown in that State. Several of these grades have been worked out at the request of the produce industry of California. In 1924, in answer to repeated demands of the grape industry, not only in that State but also in the receiving markets, United States standards were developed which cover sawdust pack, table and juice grapes. During subsequent years necessary revisions have been made, until at the present time the grades are very satisfactory.

The past two years have witnessed the development of grades for some of the more unusual crops which include fava beans, sweet anise, and sprouting broccoli. The last-named vegetable is a rather recent introduction into this country, and in a short time has gained a wide usage. Grades have been established for artichokes, which are a commodity grown in California only.

The use of these grades is not compulsory. A few States have adopted grading laws where the use of the grades are mandatory, but in California their use is entirely optional. Even though they are optional in the State, last year they were used as the basis of almost 60,000 inspections.

Transactions involved in the buying and selling of perishable products can be based upon the United States grades. They are applied uniformly in the various sections of the country. They are known alike in shipping districts as well as in receiving markets. Growers may sell to shippers with these grades as the basis, and buyers in the receiving markets are enabled to purchase a standard product by specifying the grade they may require.

With the shipment of thousands of carloads of fruit and vegetable products each year, such as apples, pears, oranges, potatoes, lettuce, cauliflower, and others, it is quite obvious that such standard grades are necessary. Perishable farm products are shipped over the entire United States. Certain products are exported, not only to Canada and Europe, but also to South and Central America, Australia, and the

Orient. In the handling of commodities for export, very careful grading of products is necessary.

The United States grades are drawn up to fit, in so far as possible, all producing and all marketing conditions. It is necessary to do this because many crops are grown in a number of States, and sold in many markets. For instance, potatoes are grown in California, Idaho, Minnesota, Maine, and many other States. The crops produced are sold competitively in numerous markets. The same principle applies to such crops as apples, cantaloupes, and numerous others.

There are a few crops which are not adapted to a single set of standards for the entire country. One important example of this is citrus fruits. California, Florida, and Texas produce the bulk of the oranges and grapefruit grown in the United States. The fruit from each of these States varies in many respects on account of differences in soil, climate, culture, and various other conditions. For these reasons it has been necessary to draw up citrus grades for the fruit of each of these three States.

The same practice has been necessary with grapes. The grapes grown in California are entirely different in variety and type from those produced in other States, and consequently it has been necessary to draw up separate specifications from those for grapes grown in the East.

The development of grade specifications entails many different factors. All producing sections must be visited by a representative of the United States Department of Agriculture. It is usually necessary to spend considerable time in the largest and most important producing centers in order to determine what may reasonably be considered as the average quality for a district. It is also necessary to visit the consuming centers in order to determine what the receiver expects or demands.

The information that is gained from these investigations shows fairly accurately the condition that must be met by a producer in normal growing years. It also shows what the receiver may reasonably expect, and what factors he considers desirable. The factors to which a receiver may object are also brought out.

Representatives of the California Department of Agriculture, together with representatives of the Federal Department of Agriculture, have interviewed growers and shippers preliminary to the adoption of grades. With some commodities such as grapes, public meetings have been held in the growing districts in order to give everyone an opportunity to present his ideas. Following these meetings the results are carefully worked out and the grades are presented to the Federal agencies in Washington for consideration. With the information that has been gathered in the terminal markets, the department is then in position to prepare the final grade.

The number of grades on a commodity usually depends upon the product. For instance, oranges have a U. S. fancy grade, a U. S. No. 1 grade, and a U. S.

¹ Field superintendent, bureau of shipping-point inspection, department of agriculture, State of California.

No. 2. The reason for this is that while the U. S. No. 1 grade includes the greatest bulk of the crop, frequently there is a demand for a limited amount of the highest quality of oranges obtainable. It is to take care of this high-quality product that the U. S. fancy grade is used. The U. S. No. 2 grade includes the fruit which, on account of score or limb rubs, or for other reasons, may not be as attractive in appearance as the U. S. No. 1 grade, although the objectionable defects that would cause the fruit to break down or seriously detract from the appearance have been removed.

Some other products, such as cauliflower, have only one standard, or the U. S. No. 1 grade. With most vegetables it is hardly practical commercially to divide them into various grades. In general, it might be said that when more than one grade is necessary, the standards are so arranged that the resulting grade requirements will group the various proportions of a crop in accordance with its commercial value. The portion of a crop showing the most desirable factors of color, shape, texture, and other desirable properties naturally falls into a higher grade, while that portion that may show more of the objectionable factors, or at least the less desirable ones, will fall into the lower grades.

There are two important points involved in all grades. The first is quality, which deals with what is often called the permanent grade factors, or those which are not subject to change such as color, shape, size, and certain defects. The second point is that of condition, which involves factors that may change after a product is harvested, such as firmness and freshness, and also includes decays, breakdown and

other deteriorations which may occur in storage or transit. Products such as apples and pears when picked may be fully mature, but their condition will be hard. As they are held in storage, they gradually soften and go through the stages of hard, firm, firm ripe, and ripe. When the product is in the ripe stage it is in the best eating condition and must be consumed almost immediately. In the firm stage it may be held for a short time, and in the hard stage, the fruit is fit for storage.

In the case of apples exported to Great Britain, in addition to meeting the grade requirements such as Fancy or U. S. No. 1, they must also meet the export standards for this particular commodity. These require the product to be tightly packed, to be no further advanced in maturity than firm ripe, and decay and other condition factors are limited to very small percentages.

Care must be exercised not to place these grade specifications either too high or too low. If the grade requirements are too stringent either a hardship is worked upon the grower or the use of the grade will be very limited. On the other hand, if the requirements of the grade are placed too low, the product will probably prove unsatisfactory upon delivery. Often after a grade has been adopted conditions may be encountered that were not previously experienced. Such conditions make changes necessary, and after a satisfactory method of handling the problem has been worked out the grade provisions may be revised.

From the foregoing it can be seen that all standards are worked out with the utmost care in order that they may be a practical aid in handling agricultural marketing problems.

GERMANY TO STANDARDIZE MOTOR FUEL

Domestic Products to Be Used, States Cable from Commercial Attaché at Berlin

Standardized motor fuel appears to be an early possibility for Germany, with utilization of a large part of domestic products, according to a cable to the Department of Commerce from Commercial Attaché H. Lawrence Groves, Berlin, Germany. The United States has been the chief supplier for Germany's great gasoline requirements, of which about 90 per cent have had to be imported until now.

Current trade reports in Berlin, stated Groves's cable, indicate the early possibility of a standardized motor fuel for the entire German Republic, utilizing a large proportion of domestic gasoline, benzol, alcohol, and methanol, with the necessary adoption of some unified control of all filling stations in the country. Allotments of import quotas among foreign suppliers also form part of the trade reports, the cable added.

However, it was the opinion of Mr. Groves that this development will not be realized for many months, pending a full and complete airing of the question.

Such action outlined by Mr. Groves's cable is understandable in the light of Germany's attempt to balance its foreign trade, and view of general economic conditions, said the announcement made public January 20, 1932, by the United States Department of Commerce. Added to this, the announcement added,

is the attempt to aid the agrarian situation by the increased use of alcohol as a fuel; and also the fact that the Leuna-Werke, originally built as a coal hydrogenation plant, has now turned to processing German crude oil. Recent discoveries of oil and rapidly increasing production of crude petroleum in the Volkenroda potash mines of the Burbach Potash Works Co., third leading producer of Germany's important potash industry, is another factor.

Petroleum was accidentally discovered there in June, 1930, and production in the Volkenroda plant increased from 1,500 tons in January, 1931, to 8,000 tons in August of the same year; production for the first eight months of 1931 amounting to 37,000 tons. It is believed that the plant's capacity will be increased from the present 100,000 tons a year to 350,000 tons a year. This increased production will greatly augment Germany's total domestic production.

Until now approximately 90 per cent of Germany's great requirements of gasoline have had to be imported from abroad, and the United States has been the chief supplier, it is pointed out by the minerals division of the Bureau of Foreign and Domestic Commerce. Thus, the United States sold Germany 5,944,078 barrels of gasoline in 1930, in addition to 1,891,942 barrels of gas oil, 1,609,873 barrels of lubricants, 60,380 barrels of crude oil, 1,152,358 barrels of fuel oil, 1,060,584 barrels of kerosene, 31,110 tons of light residue, 16,185 tons of heavy residue, or 46.5 per cent of the total imports of petroleum products into Germany.

FARM MARKETING IN NEW ENGLAND

Keeping Up Quality of Produce by Grading, Inspecting, and Identifying Vegetables and Fruits Described

By SIDNEY A. EDWARDS¹

In undertaking to discuss the future of the New England farm marketing program I am deeply conscious of the dangers besetting the prophet. Telling what is going to happen is a very ticklish job for things do not always turn out that way. So if in this brief discussion there is any particular evidence of side-stepping the issue or fence straddling it is well to realize that even our economists and prognosticators of business conditions are quite apt to clothe their language in such a way that it permits of wide interpretation.

Forgetting the prophet and his difficulties for the moment, let us return to the New England farm marketing program, and review briefly the history of this plan and its accomplishments to date. Possibly a study of its actual operation and progress will serve as the best basis on which to judge its future.

Born of the New England council and reared largely through nourishment supplied by the six State departments of agriculture, the New England farm marketing program pertains to the grading, inspection, and identification of local quality farm products. The adoption of identical or in some instances similar grades by the six New England States and the use of a uniform New England label to identify the better grades of such products has done much to arouse the interest of New England consumers in the merits of the native product.

New England farmers are not given to jumping headlong into untried programs and being for the most part individually instead of collectively minded, they have advanced rather cautiously.

On the other hand, where cooperative marketing organizations already existed as in the case of the two Connecticut poultry producers' associations or where there was group consciousness in the production and marketing of a single commodity in a particular area as in the case of the Concord and Cape Cod asparagus growers' associations in Massachusetts, the maple-sugar producers of Vermont, and the turkey growers in Vermont, Rhode Island, and Connecticut, the program has worked out very successfully.

The assembly of the products and the grading and packing operations through a central packing plant not only materially reduce the time and expense connected therewith but it means more accurate standardization, assures an adequate market supply, and greatly simplifies the inspection of the product.

Furthermore, such products handled through a central organization lend themselves particularly well to the use of a trade-mark, the employment of effective advertising, and the adoption of efficient sales policies.

While the program has really not emerged from its experimental stage, although it has been in active operation for nearly four years, sufficient evidence is at hand to conclude that it works better with some products than with others.

Fresh eggs, turkeys, maple products, tomatoes, and asparagus, as well as strawberries, lend themselves par-

ticularly well, whereas potatoes, bunched vegetables, and apples for various reasons have not fared so successfully. To put it another way, products with a comparatively high unit value or products that are not ordinarily stored for a long period of time before reaching the consumer adapt themselves better to a grading and identification program than do low-priced commodities such as most bunched vegetables and products ordinarily held in cold storage, such as potatoes, root crops, and apples.

The difficulty in the case of stored products such as potatoes is that such products properly graded, packed, and labeled before going into storage may be anything but of good quality when they reach the consumer unless they are carefully regraded and packed before leaving the cold storage plant and this, in many cases, is located at the receiving point rather than at the point of shipment.

This same condition held true this past winter in the case of a fine lot of "A" grade Baldwin apples which developed Baldwin spot in storage. In this particular case it was necessary to remove the New England quality label because the owner of the apples did not wish to give the label a bad reputation.

In the development of State grades for native farm products, United States grades are ordinarily used as a basis and varied in certain respects where local preference for some particular quality factor plays a prominent part in the local market. A person who has never made a study of local preferences in various New England markets would find only a casual observance of such factors both enlightening and interesting.

No one has yet answered the question as to why Boston wants its asparagus long and green while Providence, only a comparatively short distance away, is not so particular as to color but demands asparagus tips and not long stalks. The old story of brown eggs for Boston and white eggs for New York is along the same line. Such factors as size, color, and weight, while not always associated with better quality in the same degree as freshness, crispness, degree of maturity, and freedom from defects, are nevertheless very important in the mind of the average consumer and must be given due consideration in the establishment of retail grades.

The inspection of graded products, packed in accordance with official State grades and identified by the New England quality label, falls within the scope of work assigned to the State department of agriculture. Trained inspectors watch these products from the time they leave the farm until they reach the consumer. While every package is not handled by an inspector, a sufficient sample is examined to satisfy him that the quality of the product is up to grade as represented.

In case a customer secures a product bearing the New England quality label which is not satisfactory, she has the privilege of appealing to her State department of agriculture with the assurance that the com-

¹ Director, bureau of markets, department of agriculture, State of Connecticut.

plaint will be followed up immediately. It is worthy of note and a tribute to the integrity of New England farmers as well as to the present inspection service that serious complaints are the exception rather than the rule. Apparently those producers identified with the program want to see it succeed and realize that the surest road to success is via the satisfied customer.

In summarizing the progress made to date, suffice to say that at the present time there are over 1,800 leading New England producers who have sought the privilege of becoming identified with the program and these men have purchased an aggregate of 6,723,717 New England quality labels to identify their better-quality products.

Turning from the past to the future, I believe the possibilities ahead are particularly bright. The program has been tried and the principles behind the plan have proven to be sound. The agricultural colleges and experiment stations are becoming more deeply interested in its benefits to the New England farmer. As the program grows, the departments of agriculture will be required to devote more time to the regulatory and service activities and less time to the promotional or educational side. This particular phase will naturally be assumed by such agencies as the State college extension service, county farm bureaus, and vocational agricultural teachers.

With the progress of the program the imperative need for many types of research studies has developed and this work will most naturally be conducted by the various State agricultural experiment stations where the equipment and trained personnel for such studies are available.

To assure the permanency and stability of the program, much of the responsibility for its success must fall on the producer. Experience has shown that group or cooperative action is far more effective than individual action and while in the beginning many individual producers served as pioneers in demonstrating the soundness of the principles involved, we look forward to the rather rapid development of local, county, State, and possibly New England wide cooperative sales agencies operating under producers' direction but in immediate charge of competent managers who will employ such expedients as effective advertising and aggressive sales policies in placing local quality farm products in the hands of the New England woman buyer.

Consumer organizations, State federations of women's clubs, civic and community organizations of various kinds are showing a wonderful interest in the program and want to see it succeed.

The press of New England, both metropolitan and local, as well as the several New England broadcasting companies, are not only sympathetic but enthusiastic over this attempt to put the New England farmer in a more advantageous position by assisting him in the solution of his biggest problem—better marketing.

What the program needs right now more than anything else is a larger volume of graded products, efficiently marketed and effectively advertised.

Believing thoroughly in the soundness of the principles underlying the New England farm marketing program but basing my present judgment not on that belief but entirely upon the change in sentiment toward the program during the past four years, I must confess that I am very optimistic as to its future.

CENTRALIZED PURCHASING AT CHICAGO

Standardization Board to Be Established for Setting Up Standards and Preparing Specifications to Be Used by City Departments

The ever-increasing value placed upon centralized purchasing methods, particularly with respect to governmental purchasing, is significantly attested by the recently passed ordinance providing for just such a system in the city of Chicago. This plan, part of a broad reorganization of municipal affairs under the administration of the present mayor, is expected to contribute much to a general reduction of local corporate expenses.

In that division of the municipal survey dealing directly with centralized purchasing, the National Association of Purchasing Agents and the Chicago Purchasing Agents Association took an important part. A former president of both these organizations was personally responsible for the thorough and vigorous study of this section of the work, while a past research secretary of N. A. P. A. and nationally recognized as an authority on governmental purchasing acted as special consultant for the N. A. P. A. He was ably assisted by a delegate of the Chicago association.

Some of the salient features of that part of the report pertaining to centralized purchasing are set forth in the following paragraphs.

The present provisions of the municipal code bearing upon purchasing powers and procedures in the separate city departments and bureaus are to be repealed and a department of central purchasing established. This department is to have charge of the purchasing and contracting for supplies, materials, and equipment, and contractual services required by the various agencies under the control of the city council. Further, if any other board or department under city government, but not under the control of the city council, wishes to participate in the central purchasing system, it is to be permitted to do so.

Within the purchasing department itself there is to be established a standardization board, for the purpose of setting up standards and preparing specifications for the minimum number of qualities, sizes, and grades of commodities to be used by the city departments. In the establishment of standards and standard specifications, the board is expected to make use of the engineering and testing facilities of the different departments and to make all standards conform as nearly as possible to the requirements of the using departments.

It is recommended that the department embrace the following bureaus:

(a) The bureau of standards and specifications, which, working in conjunction with the standardization board, would prepare and revise written specifications and confer with the using departments in order to ascertain the suitability of current specifications.

(b) The bureau of purchase and contract, which would have charge of purchase negotiations. It would secure competition through various agencies; would receive, open, tabulate, and submit such bids with recommendation for award to the commissioner for decision; and would keep a record of all commodity purchases as an index to price and consumption trends.

(c) The bureau of inspection and testing, which would conduct occasional inspections and tests in order to determine whether the regular inspection forces were satisfactorily performing their duties.

(d) The bureau of stores, which would receive and check all requisitions from the operating departments; would receive regular inventory reports on the amount and value of commodities on hand; would transfer or salvage any surplus or obsolete stock; would operate an office-supply stock room for all agencies in the city hall and a central mimeographing service.

In addition to the foregoing recommendations, it was suggested that the department of central purchasing have power to request, to receive, and to check estimates of future requirements of the operating departments for such period of the fiscal year as it might deem advisable, and to consolidate such estimates wherever possible for quantity purchasing according to the standard specifications adopted by the board of standardization.

The department is to have no connection with or supervisory control over the awarding of public works or other construction contracts. It is to make occasional inspections and tests to determine whether the specified commodities are actually being received. Labor-saving devices are to be used for more efficient and economic handling of all work done. A modern, simplified, purchasing procedure to secure wide and free competition is advised, and it is urged that the department be furnished with the necessary report and statistical information so that it may gauge the most economical time to buy in the market.

The foregoing recommendations were supplemented by detailed instruction as to system, forms, records, and procedure, and a suggestion as to the form of ordinance that would make the recommendations effective.

PROMOTING HOME-OWNERSHIP PLANS

Tangible, Beneficial Results of President's Conference on Home Building and Home Ownership Are Appearing, Says Conference Secretary

The establishment of regional and local organizations to carry forward general as well as specific measures outlined in Washington December 2-5, 1931,¹ at the President's Conference on Home Building and Home Ownership are evidence of the tangible, beneficial results already appearing, according to Dr. John M. Gries, executive secretary of the conference.

Among localities in which organizations have been perfected may be cited the following areas: Pittsburgh, Massachusetts, Westchester County, N. Y., and New Jersey, where the respective real-estate board is engaged in activities designed to spread home ownership and to remove existing housing evils. Financing problems, regarded by the December conference as perhaps the most serious confronting it, are to be handled in Cincinnati by an organization of banking and city representatives which will look after the matter of mortgages.

"It is obvious, of course, that the conference will not attain its potential value unless its findings and the facts brought out by it are spread to the persons whom will benefit," said Doctor Gries in discussing the program. "Thus a considerable part of the present task of the conference, which still exists through a continuing committee, is of an educational nature."

Doctor Gries further pointed out that requests are coming in by the thousands for information on the various phases of housing and home ownership touched on by the conference. That the conference

in Washington was something of a pioneering, epochal event is attested to by the fact that these requests are coming not only from the general public, but also from persons or groups closely connected with building, housing, and construction activities who would be the most likely to have information of their own on matters taken up by the conference.

Data previously not available were brought together by the conference, and a widespread demand for facts is pouring in from State, municipal and civic leaders, realtors, subdividers, contractors, architects, manufacturers, dealers in materials, carpenters, masons, plasterers, plumbers, bankers, building and loan officers, engineers of several kinds from civil and electrical to mechanical and sanitary, landscape architects, city planners, building inspectors, traffic authorities, utilities men, and tax specialists. Home economists, decorators, sociologists, psychologists, doctors, lawyers, educators, and editors have likewise shown an interest.

Numerous articles are being sent out by the conference to magazines, trade journals, and newspapers which will further promote the work suggested by the Washington meeting. The delegates to the gathering, numbering nearly 3,600 and representing every State as well as such distant Territories as Porto Rico and Hawaii, are another force working to place home building on a scientific basis.

Numerous reports have reached the conference of the efforts of various local units, such as women's clubs, real estate boards, civic bodies, and other or-

¹ COMMERCIAL STANDARDS MONTHLY, January, 1932.

ganizations to study and promote particular phases of the subjects brought before the Washington meeting. Immediately favorable results are expected from some of these efforts. It can readily be seen, however, said Doctor Gries, that where a women's club is sponsoring a demonstration home, for example, benefits may be delayed at least until the home is completed.

A definite plan by which the country may be organized more effectively in the interests of American homes has not yet been worked out. There is some difference of opinion as to the best method to be followed. Some persons feel that State agencies should be set up, functioning for the State in much the same manner that the general conference is functioning for the Nation. Others believe municipal organizations more desirable.

At present it is somewhat early for an inventory of the results of the conference and an estimation of

the nature of problems not yet solved and needing further attention. When the experience attained from the first conference can be summed up, there will perhaps be an opportunity for another national gathering to take stock of the status of the home building and ownership movement and to determine along what lines further action is desirable.

The conference has learned that at least one community has set up an information center where the layman may obtain fundamental data on home construction in its various phases. If a number of communities should establish similar centers, there would be an opportunity for the second conference to discuss their value and their problem, in the light of the experience gained. The conference is not planning any campaign for legislation that would promote home ownership, although the establishment of home loan discount banks proposed by President Hoover is in line with recommendations of the conference.

CERTIFIED SUPPLIES FOR SCHOOL JANITORS

National School Supply Association Creates Certification Program as Protection to Both Buyer and Seller

By J. W. MCCLINTON, *National School Supply Association*

The National School Supply Association has been actively promoting simplification, standardization, and certification of various items in the school supply and equipment field. Of the several projects undertaken by the association toward that end, one of the most constructive, one of the most far-reaching in beneficial efforts, and one of the most effective for safeguarding the school purchaser, is the certification or labeling of janitor supply products.

The writer, during his many years in the superintendency field, was constantly perplexed when it came to the purchase of janitor supplies because of the absence of basic standards for the measurement of values. Many superintendents are still having the same experience, judging from the favorable reactions received from these men in regard to the certification program. In fact, it is in response to a persistent demand over several years' period from school officials that some standards be established for janitor supply products that the association has undertaken this program.

For the time being, the quality labeling program will apply to liquid and scrubbing soaps, disinfectants, and deodorants. As the movement gets under way, other items will be added to this list, notably floor brushes, etc., also the development of container standards and the per pupil usage of the products per year.

A program of identification of ingredients manifestly has its advantages. It affords a definite basis for checking purchases of janitor supplies. It furnishes a measuring rod for determining the quality of the product purchased. A known quality product at a known fair price is safer than an unknown product at any price.

Most schools, because of the limited quantity of the product used, do not find it practicable or convenient to make the laboratory tests for definitely determining the ingredients on each purchase made. Others do not have available the testing facilities, and

the cost of a testing service for small purchases would prove expensive. To these purchasers the centralized testing and labeling plan affords a decided service. There will always be a sufficient number of companies which have taken advantage of the certification privileges from which purchases may be made to retain the competitive element.

What is the purpose of the certification program? is a question often asked. First of all, it will afford a source of supply for janitor supplies devoid of misrepresentation as to the quality of the product. There have been misrepresentations. There need not be. There should not be. It is an objective of honest business to eliminate it. It is unethical competition to meet misrepresentation by misrepresentation. If misrepresentation is necessary to get the business, the majority of concerns will choose to loose the business. That is the penalty that should not be imposed on honest selling.

This program of the National School Supply Association affords the purchaser the opportunity to take advantage of definite specifications in purchases if he desires to do so. There is nothing compulsory on the part of the buyer or seller. It does give the buyer the basis for measuring values which he has long desired, and it gives the seller the label or certified form of guarantee if he desires to take advantage of it. When the quality of the product is not known, competition centers on the claims for the product, exaggerated or otherwise, without any common standard for price comparisons.

Janitor supply products represent a line of supplies that is hard to measure in quality. It is not a poundage or yardage merchandising—it is an ingredient merchandising. The heretofore lack of standards and the intangible means of measuring the claims for a quality product have proved a rich field for the "bootleg seller"—the temporary agent group.

It is in this temporary selling group that the evils of selling through misrepresentation have been so much in evidence. The transient salesman has no reputation to protect, has no interest in establishing a good will as an asset, has no interest in repeat orders, has no interest save the present sale, and the marginal profit as wide as the market will afford.

There is, therefore, no restraint on overselling a purchaser or unloading onto a school system products not essential for the school need. This is a selling program that no legitimate distributor or manufac-

turer can subscribe to, a type of competition that he will not meet, a selling program that brings unjust and unfavorable reactions upon those established houses engaged in ethical merchandising. The program should operate to the protection of both the purchaser and the seller.

The National School Supply Association is committed to a policy of service. It is the conviction that this certification program will so function for the school official intrusted with the purchases of janitor supply products.

BRAZILIAN FEDERAL PURCHASING BUREAU

Technical Section of Bureau to Determine Standards of Articles Purchased

By ROGER D. MOORE, *United States Department of Commerce*

Federal Government purchases in Brazil will be centralized in a single bureau under the Ministry of Finance, according to a recent decree, No. 19587.¹ It would seem that by virtue of this new decree, contracts for the purchase of materials and supplies for the Federal service need no longer be approved and registered by the Tribunal de Contas in order to be made binding.

Innovations such as the required employment of specialists and the establishment of laboratories to conduct physical, chemical, technical, and resistance tests under direction of the bureau are expected to place the making of such purchases more upon a scientific basis.

An agency for the development of standards, established by a somewhat earlier decree to make official standards as regards articles destined for the public service of the Union, is now to function as a part of the technical section of the bureau. If successful, the various States and municipalities of Brazil quite likely will establish similar bureaus.

The bureau is to be headed by a commission of three—a chairman and two directors. Collectively, they are to decide on purchases. In addition, there are two divisions, each headed by a director. The first consists of (1) a technical section concerned with the study of projects and materials as well as manufacturers and agents in Brazil and abroad, market prices and tendencies, laboratory tests, and the preparation of budgets and publications; and (2) an accounting section, charged with recording invoices, issuing orders or certificates of payment, and the fiscalization of agencies and subagencies. The second division is to be comprised of: (1) A section of departmental requests, to which pertain a register of materials requisitioned, and current accounts of the departments; (2) a section of acquisitions to be in charge of warehouses, stocks, and contracts of acquisition; and (3) a section of dispatch to handle transportation and insurance services, postal orders, bills of lading, and deliveries, including claims thereunder.

The commission is to operate in the national territory by means of limited agencies and subagencies.

whose functions correspond generally to those of the central commission, to which they are responsible. Due authorization must be procured before executing local contracts.

Disbursements for materials destined for distribution among the departments (Ministerios) are to depend upon allotments in the respective budgets, no requisition of material being allowed unless the balance of the particular departmental allotment is sufficient to meet it. Although under the decree, the departments are not directly to acquire any material, they may explain to the commission why different types from those officially designated should be adopted. Requisitions, which must be signed by those responsible for using the allotments, must set forth the purposes for which the articles are desired. Portions of allotments remaining are to be remitted by the tribunal of accounts to the national treasury.

Merchants and manufacturers, whether located in Brazil or abroad, may, at any time, and not necessarily upon solicitation, submit quotations and bids for materials offered, and may modify or withdraw same at any time. Heretofore foreigners residing outside Brazil could bid only when expressly requested by the Government. Whenever it may be necessary to do so the commission may solicit bids by press or letter. It must require of bidders sufficient proof of capacity, and—except in orders not exceeding 50 contos (\$5,981.50 at par exchange) for delivery within 30 days by local suppliers of known capacity—must cause a contract to be drawn and a guaranty of 10 per cent of the value of the order deposited. Bad faith in failing to fill an order properly subjects the deposit to forfeiture and bars the supplier from further supplying the Government.

In the selection of a supplier the following factors are to be considered: (1) His capacity, (2) prices as compared to those of the market; (3) terms of delivery, in consideration of the urgency of current orders; and (4) other conditions proposed. Quotations and bids received, the average prices of domestic and foreign markets, and prices paid in purchases are required to be published each month, and audited annually. Payments will be made as originally stipulated at sight or on terms; in the latter case, the supplier will be issued negotiable certificates payable at maturity by the commission.

¹ Decree No. 19587, as published in the Brazilian *Diario Oficial*, Jan. 16, 1931, is on file in the Division of Commercial Laws, U. S. Department of Commerce, Washington, D. C., as well as a translation by Commercial Attaché Carlton Jackson, Rio de Janeiro.

RADIO AIDS NAVIGATION

Greater Safety in Air Navigation Seen Through the Development of Radio Aids

By J. H. DELLINGER, *Bureau of Standards*

Radio is responsible for great advances in the safety and accuracy of navigation. The navigational uses of radio have a history of about 20 years on the sea and about 10 years in the air, and are of rapidly spreading importance at the present time.

Radio aids navigation in two principal ways: As a means of communication and as an instrumentality of navigation on course finding. Radio provides the only means of communication to ships or aircraft at a distance, and has destroyed the isolation of ocean voyages. As an instrumentality of navigation, radio serves to provide either (a) a homing means; that is, means to reach a desired point, (b) a means of navigating a desired course, or (c) a means of determining position. Radio functions regardless of fog, tempest, or distance, and thus provides unique services which are bound to be of increasing value to navigation. It supplements rather than displaces other navigational aids, such as the compass, sextant, and sonic depth finder.

The differing requirements of marine and aerial transportation have led to different kinds of uses of radio. In the marine service, radio communication is mainly telegraphic, although telephony has been added recently on the larger vessels. In aviation, radio communication is mainly telephonic. In the uses of radio as a navigational instrumentality, the principal marine system utilizes radio direction finders aboard the vessels to determine the line of direction of radio signals from a known source, while the system used in aviation in the United States employs directive radio beacons which mark out the directions of the airways and are received with nondirectional receiving apparatus on the aircraft. Another navigational system employing direction finders on land to determine the line of direction of radio signals from the moving vessel has been used in marine navigation and is the method used in aerial navigation in Europe.

The Bureau of Standards has been active in the development of the various radio aids to navigation. The system of aids to marine navigation is now standardized throughout the world. There is a great deal of activity at the present time in developing and extending the use of radio in connection with air navigation. In the United States the research phases of this work are carried on by the Bureau of Standards for the Aeronautics Branch, Department of Commerce.

The system of radio aids to navigation on the airways of the United States has the advantage that it imposes the minimum requirements on the airplane operator. There are many other possible systems, but they require more specialized equipment aboard the airplane or require more attention or some manipulation in use. The directive radio beacon system enables a pilot to continue along the regularly traveled airways when no landmarks, sky, or lights are visible. It largely removes the chief limitation on reliability

of scheduled flights, viz, delays due to fog. This system tells the pilot as soon as he veers from his course, indicates on which side he is off, shows him the way back, and informs him when he arrives at his destination.

To use the radio aids provided by the Government, an airplane need be equipped only with simple radio receiving apparatus. Transmitting stations for radiotelephony are located on the ground, usually at airports about 200 miles apart. At these airports are located also the directive radiobeacon transmitting stations. The radiotelephone stations send out messages regarding weather, landing conditions, etc., while the beacon stations send out directed signals of a special type for the sole purpose of making out the line of the airway. A single receiving set aboard any airplane receives both classes of service. Thus any number of airplanes may be served simultaneously. This is one advantage of the system over the European system which can serve only one airplane at a time. Another advantage is that the airplane is required to carry only a receiving set, whereas in the European system the airplanes must be equipped for transmission as well as reception.

A number of air transport lines in the United States do provide transmitting apparatus aboard their airplanes, and carry on two-way communication with ground stations owned and operated by them. This system supplements the Government system which gives service to all airplanes whether or not they carry transmitting apparatus.

There are now on the airways of the United States 88 directive radiobeacon stations, and 62 radiotelephone stations broadcasting weather and other information to airplanes in flight, all maintained by the Government and operating on low frequencies. There are in addition 107 radiotelephone stations, operating on high frequencies, maintained by the air transport companies for two-way communication with airplanes in flight.

The use of radio as a navigational means has still further possibilities. Collisions between airplanes in fog are a real hazard; experiments on a radio warning system to obviate this danger are in progress. Another use of radio in navigation, which is advancing even more rapidly to the stage of practical use, is the aiding of airplanes to land under conditions of low or zero visibility.

The radiobeacon system is adequate to guide airplanes along the airways, but no means have hitherto been provided to insure a safe landing in heavy fog. Radio has been applied to this problem with marked success, giving the pilot full information, during the movements of landing, of his position laterally, longitudinally, and vertically. When this method for blind landing is in operation on a routine basis, the aviator will be indebted to a radio for a comprehensive system of navigational aids.

NEED FOR UNIFORM METHODS OF RAILROAD-CROSSING PROTECTION

Importance of Uniform Methods of Protection at Highway Grade Crossings Throughout the Country Reviewed

By R. H. AISHTON¹

In the interest of increased safety to the public there is a constantly growing necessity for the bringing about of uniformity in the methods of protection at highway grade crossings throughout the country. In addition, there should be State supervision over the creation of new grade crossings, and uniform laws and codes relating to safety on the highways.

How to bring about increased safety at railroad highway grade crossings has been a pressing problem that has faced the railroads for years. Elimination of such crossings would naturally solve this problem but that is both a physical and financial impossibility and even the elimination of the most important ones involves serious financial questions.

Due to the increased use of the highways by motor buses, trucks, and private automobiles, railroad expenditures for protection at railroad grade crossings have constantly increased in the past 10 years.

Class I railroads in 1930, according to a special study just completed by the Bureau of Railway Economics, spent \$33,070,708 for the protection or elimination of such crossings. Of that amount, \$30,218,124 alone was spent for separation of grades, an increase of \$4,514,845 over the amount expended for that purpose in 1929, and an increase of \$3,923,972 above the amount spent in 1928.

In 1930 there were 465 fewer fatalities resulting from accidents at railroad highway grade crossings than in 1929, and reports filed with the Interstate Commerce Commission for the first 10 months in 1931 also show a slight reduction for that period compared with the same period in 1930. There are, however, altogether too many lives lost as a result of such accidents, but the question of providing adequate protection is complicated by the fact that more than 25 per cent of the accidents at railroad highway grade crossings result from motorists crashing into the sides of trains.

The fact, however, that a reduction is being shown in the number of accidents at grade crossings would indicate that a large part of the driving public is endeavoring to cooperate with railroad and safety organizations, which are urging greater care in approaching, and passing over, railroad highway grade crossings.

Due to the fact that various phases of safety and protection at railroad highway grade crossings are being handled by many interested parties, such as Federal, State, municipal, and local governments; motor-vehicle associations; civic and business organizations; and by railroad managements, there is a lack of uniformity in meeting the situation and in providing

protection at such points. In the interests of safety to the public at large, nation-wide uniformity in methods of warning motorists of danger at railroad highway grade crossings would be advantageous, so that motorists traveling from State to State will have no difficulty in recognizing these warning signals.

There should also be a designated authority in each State to pass on the construction of new grade crossings. At the present time many States exercise no definite regulation over this matter, while in other States such authority is divided. There is also a lack of uniformity on the question of dividing the cost involved in the elimination of grade crossings. In many instances the burden of the cost is placed on the railroad, although such elimination is largely for the benefit of the users of the public highways. Serious consideration should be given to this fact in apportioning the cost of grade-crossing protection.

The National Conference on Street and Highway Safety has thoroughly studied the question of safety in an effort to reduce the number of accidents on the highways, and it is of the opinion that without appropriate and uniform legislation, satisfactory results, so far as safety is concerned, can not be obtained in the fullest measure. It is clearly in the public interest that the recommendations of the National Conference on Street and Highway Safety be adopted by the several States.

In order to bring about uniform practices and understanding among the various railroad organizations and to present in a concise and positive manner the recommendations of the railroads embodying the latest thought in highway grade-crossing protection, the American Railway Association has appointed a joint committee on grade-crossing protection, consisting of members representing the operating, safety, engineering, and signal departments of the railroads. This committee was instructed to recommend and to coordinate the activities of the railroads in conforming to the principles adopted, and to provide a medium by which public authorities can be acquainted with the most modern thought of the railroads in these matters. It has recently issued a manual on railway-crossing protection measures giving details of the standard signs, warning signals, and other devices. These are in complete harmony with the standards adopted by the National Conference on Street and Highway Safety.

This joint committee offers its cooperation to any State, highway, or railroad commission, State legislative committee, or automobile association, and will aid such organizations in any practicable way to bring about recommended practices in the interest of preventing accidents at railroad highway grade crossings.

¹ President, American Railway Association, Washington, D. C.

FEDERAL SPECIFICATIONS

Twenty-one specifications were acted on by the Federal Specifications Board during the month of January. Of this number 7 were submitted for consideration as proposed specifications, and 14 were submitted for revision. The specifications submitted for revision bear the new designation in accordance with the system used in the Federal Standard Stock Catalogue. Copies of these specifications and further information can be obtained from the Federal Specifications Board, Bureau of Standards, Washington, D. C.

Brick, concrete-----	SS-B-663
Undershirt, men's (flat knit wool-cotton, heavy weight, high neck, long sleeve, pull-over)-----	
Underdrawers, men's (flat knit, wool-cotton, heavy weight, ankle length)-----	
Towels, machinery, wiping-----	
Tar, pitch, for joint filler-----	
Tar, refined, for use as crack filler-----	
Tomato puree, canned-----	JJJ-T-581

New designation	Specifications for revision	Former F. S. No.
EE-G-391a-----	Ginger ale-----	
QQ-B-601-----	Brass, castings, to be brazed-----	286
QQ-B-726-----	Bronze, manganese, castings-----	370
QQ-F-171-----	Ferromolybdenum-----	143
QQ-F-201-----	Ferrovandium-----	135
QQ-S-566-----	Solder, spelter (for) brazing-----	306
QQ-S-571-----	Solder, tin-lead-----	313
QQ-W-401-----	Wire, phosphor-bronze, spring-----	532
SS-B-661-----	Brick, building (common, clay)-----	504
SS-B-666-----	Brick, common, sand-lime-----	505
VV-G-86-----	Gasoline, aviation, domestic grade-----	
VV-G-89-----	Gasoline, aviation, fighting grade-----	
WW-P-378-----	Pipe, copper, seamless, iron-pipe size, standard-----	
WW-T-781-----	Tubes, condenser and ferrule-stock admiralty-metal-----	374

SIZES OF STEEL SPIRAL RODS

Producers, distributors, and users of concrete reinforcement have been asked to consider a new draft of the simplified practice recommendation covering steel spiral rods. The proposal includes the same sizes of rods as were listed in the original draft approved by the industry in January, 1926. The new edition of the simplification will include a detailed table to facilitate the use of the standard sizes by specifying authorities. This, it is believed, will enhance the value of the recommendation.

On September 9, 1924, representatives of manufacturers, distributors, and users of steel reinforcing bars convened in Washington, under the auspices of the division of simplified practice of the Bureau of Standards, to consider the advisability of reducing a minimum the number of sizes of that commodity. In view of the successful simplification of such steel products as metal lath, woven wire fencing, sheet steel, and terneplate, the rolling mills and building contractors concurred with the distributors of steel bars in the belief that less costly inventories would bring about minimum quotations in connection with public works and privately owned construction.

This unanimity of opinion of all interests gave simplified practice recommendation No. 26, Steel Reinforcing Bars, a propitious start when it became effective on January 1, 1925. The faith of the industry in the efficacy of the step they were taking was manifested on January 26, 1926, when the first revision conference reported a satisfactory year and recommended the continuance of the schedule until such time as it should become desirable to adapt the simplified list to changing conditions.

The industry was so successful with this first experiment in simplified practice that it decided to subject steel spiral rods to similar treatment. For this purpose the Concrete Reinforcing Steel Institute made a survey of current practice which might serve as a tentative recommendation to facilitate the marketing and use of this type of concrete reinforcement.

The simplified practice committee appreciated the necessity of respecting the majority demand for steel spirals and sought to establish a list of sizes and pitches which would accurately reflect the best thought and practice in the industry, and which would have due regard for minimum pitch and ratio of pitch to diameter of column cores.

The proposed new draft of the recommendation is to be effective upon announcement by the Bureau of Standards that the various elements of the industry have recorded the necessary degree of acceptance.

STANDARDS FOR SORTING, PACKING, AND MARKING FRESH FRUITS IN NORWAY

The Norwegian standardization committee has issued its proposed standards for the sorting, packing, and marking of fresh fruits, according to information received from Gudrun Carlson, American trade commissioner at Gale, Norway.

In his report Trade Commissioner Carlson pointed out that it has been a recognized fact that Norwegian fruit could not expect to compete with imported goods until some more improved standards were adopted. In 1917 the agricultural department appointed a committee to study the matter. In 1918 the committee worked out rules for the sorting, packing, and marking of finer grades of apples and pears. The crate or container agreed upon was that used in Canada. Later a crate for medium grades was adopted, and lastly a crate for stone fruit. In the complete standards now proposed the containers already adopted are taken for granted as used.

The standards adopted in 1918 for apples and pears have been more and more followed by the fruit dealers as well as fruit growers and have been changed in a few instances to comply with American and English standards, but at the same time kept to a form suited to Norwegian sales and transport conditions. Rules for stone fruits have been less thoroughly tried out but are based on careful investigation.

In 1922 the committee referred to became a part of the organization known as Selskapet Havedyrknings Venner (Society of Friends of Gardening). The standards now proposed have been formulated by this cooperative committee and referred to the standardization committee of the Norwegian Agricultural Association. The purpose of issuing the proposed standards now is to obtain criticisms and suggestions for any changes or modifications.

After the standards are finally adopted they are not to be obligatory but recommended as a step toward improving the handling and sale of Norwegian fruit.

STANDARDIZATION IN COMMUNICATION

A symposium, Standardization in Communication, will be a feature of the Standards Yearbook for 1932. It will comprise articles by experts on the following subjects:

- *1. Standardization in Aeronautical Communications, by Clarence M. Young, Assistant Secretary of Commerce for Aeronautics.
- *2. Communications and Weather Service for Airways, by Charles F. Marvin, chief, Weather Bureau, United States Department of Agriculture.
- *3. Research as a Basis for Standardization in the Art of Communication, by Dr. Frank B. Jewett, president, Bell Telephones Laboratories (Inc).
4. Standardization in a National System of Telephony, by H. S. Osborne, transmission engineer, American Telephone and Telegraph Co.
- *5. Standards in Telegraphic Communication, by C. E. Davies, general commercial engineer, Western Union Telegraph Co.
6. Communication with Quasi Optical Waves, by Eduard Karplus, engineer, General Radio Co.
- *7. Amateur Radio Communication, by C. A. Briggs, American Radio Relay League.
- *8. Performance Standards to Aid in Buying Radio Sets, by Orestes H. Caldwell, editor of Electronics and Radio Retailing.
- *9. Progress and Need of Standardization in the Radio Field, by J. W. Horton, chairman, standardization committee, Institute of Radio Engineers.
- *10. Standardization of Naval Radio Material, by Rear Admiral Samuel M. Robinson, chief, Bureau of Engineering, United States Navy.
11. Standard Radio-Frequencies and their Dissemination, by J. H. Dellinger, chief, radio section, Bureau of Standards.
- *12. Radio Aids to Navigation, by J. H. Dellinger, chief, radio section, Bureau of Standards.
13. The Velocity of Radio Waves, by N. Ernest Dorsey (principal scientist), Bureau of Standards.
14. Communication of Standard Time Signals, by Lieut. Marcy M. Dupri, United States Navy (in charge of Naval Observatory time service).
15. Relation of Standard Time to International Communication, by R. E. Gould, chief, time section, Bureau of Standards.
16. Communication by Racing Pigeons, by W. F. Dismer, Washington, D. C.
- *17. Some Standard Means of Tribal Communication, by Dr. Walter Hough, head curator of anthropology, Smithsonian Institution.
- *18. Television as a Field for Standardization, by C. Francis Jenkins, Washington, D. C.
- *19. Standardization in the Communication System of Railways, by W. P. Borland, director, Bureau of Safety, Interstate Commerce Commission, Washington, D. C.
- *20. The Standardization of Language, by Thomas A. Knott, the general editor of the Merriam Webster Dictionaries.
- *21. Standard Means of Communication for Deaf Mutes, by Josephine B. Timberlake, superintendent, The Volta Bureau, Washington, D. C.
- *22. Standardization in Military Communication, by Capt. Fred G. Borden, Signal Corps, United States Army.
23. Standard Control of the Acoustics of Auditoriums, by Paul R. Heyl, chief, sound section, Bureau of Standards.
- *24. Standardized Signs and Signals to Promote Highway Safety, by M. G. Lloyd, chief, safety section, Bureau of Standards.
25. Standardization in Post Office Department.
- *26. Standardized Communication Aids to Marine Navigation, by T. U. O'Connor, chairman, United States Shipping Board.
- *27. Standardization of Service Areas of Radio Broadcasting Stations, by C. M. Jansky, jr., Washington, D. C.
- *28. Standardization of Aids to Navigation Maintained by the Bureau of Lighthouses.

These articles will be printed in full in the Standards Yearbook for 1932. Several of these, marked*, are being preprinted in the COMMERCIAL STANDARDS MONTHLY.

A. S. T. M. COMMITTEE SET UP FOR MORTARS FOR UNIT MASONRY

A new standing committee of the American Society for Testing Materials has been organized to undertake work in the field of mortars for unit masonry. This committee will have as its scope of function, research to promote knowledge of properties and tests of mortars for unit masonry and development of methods of test and specifications for such mortars. The activities of this committee will be closely correlated with other interested committees of the society.

While tremendous strides have been made in the knowledge and use of mortars in the thousands of years during which they have been used, there is still a great deal to be learned about the various types. This subject is an important one and many millions of dollars are expended annually for structures in which mortars are an important material.

With the organization of this committee, there are 51 standing committees of the American Society for Testing Materials with a total membership of about 2,500. These committees study the properties of materials of engineering and develop standard specifications, methods of test, definitions, and recommended practices.

BAG, CASE, AND STRAP LEATHER

The printed edition of the commercial standard for Bag, Case, and Strap Leather, CS34-31, has been announced by the division of trade standards, Bureau of Standards. The pamphlet is now available for purchase from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 5 cents a copy.

This standard covers the regular thicknesses for bag, case, and strap leather in terms of the most commonly used designation, the "ounce," with comparable thicknesses in millimeters, sixty-fourths inch, and thousandths inch. "Bag, case, and strap leather" is a general term for leathers used in traveling bags, brief cases, suit cases, pocketbooks, and straps. It does not include the light leathers employed for women's fancy hand bags. The staple material for bag and case leather at present is leather made from the hides of animals of the bovine species, but heavy sealskins and goatskins are also used. It is the grain side (hair side) of cattle hide, reduced to a specified thickness ranging from 1 to 10 ounces according to the Woburn or equivalent standard gage. Split leather should be designated as "split" leather, as it is not included in the above classification.

The commercial standard was proposed by the bag, case, and strap leather group of the Tanners' Council of America and recommended by a general conference of the industry for the universal adoption of all interests of the business to eliminate the confusion and misunderstanding that has hitherto existed in the purchase and sale of the commodity.

All references to scale weight in connection with the gage thickness is eliminated as inconsequential, since the purchaser of leathers in this group is concerned principally with the physical thickness of the leather and its corresponding strength rather than the weight of the piece per square foot.

The effective date for the application of this standard was fixed for August 1, 1931.

STANDARD UNIT FOR DETERMINING QUANTITIES OF PETROLEUM PRODUCTS

The standard unit used most extensively in this country for determining quantities of gasoline and other petroleum products in commerce is the gallon, defined as 231 cubic inches of liquid at 60° F. In large-quantity shipments, tank cars, for example, it is customary to observe the volume of gasoline at the existing temperature (by reading the gauge in the dome of the tank car) and to reduce the observed volume to the equivalent volume at 60° F. by the use of certain volume correction factors, such as those given in National Standard Petroleum Oil Tables, Bureau of Standards Circular No. 154.

The factors given in these tables are based upon measurements made prior to 1916 in the thermal expansion of straight-run gasoline, the only type of motor fuel in general use at that time. Recently additional measurements have been made on present-day motor fuels, approximately 50 per cent of which are now produced by various cracking processes or by mixing gasoline with benzol.

Measurements have been made on the coefficients of expansion of 9 straight-run gasolines, 16 cracked gasolines, 3 motor benzols, and 5 benzol blends. These materials were submitted for use in this investigation by 20 different oil companies. The samples were derived from crudes from 7 different States and the cracked gasolines were produced by 6 different cracking processes, including both liquid and vapor-phase processes.

It is generally recognized that volatility is more significant than gravity as an index of the suitability of a gasoline for a particular use. Most specifications, for example, require a distillation test, whereas a gravity determination is not required. It appears from the results obtained in this investigation that volatility also serves much better than gravity as an index of thermal expansion.

It has been found that a table of volume correction factors for aviation gasolines and motor gasolines, based upon volatility, represents the results obtained on all the motor fuels with an accuracy better than 0.07 per cent in the correction factors for the usual temperature range 40° to 80° F. This is equivalent to an uncertainty of less than 1° F. in the determination of the average temperature of the motor fuel.

This subject is discussed in detail in the December number of the Bureau of Standards Journal of Research. Copies of the Journal may be secured from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 40 cents each.

FELDSPAR

The Commercial Standard for Feldspar, CS23-30, has been reaffirmed, without change, for another year beginning September 1, 1931, or until authorized revisions are duly indorsed by the industry. This action was taken upon the recommendation of the standing committee after considering the results of an adherence survey undertaken in cooperation with the producers of feldspar.

The report summarizing the results of the survey, was based on replies from 12 producers of this com-

modity. Complete adherence to the provisions of the commercial standard were reported by 5 producers. The production of feldspar conforming to the requirements of the standard was reported as averaging 51 per cent of individual production (average of 12 replies not weighted according to individual production.)

Deviations from the commercial standard requirements were attributed to: (1) Demands from purchasers, (2) specification not close enough, and (3) lower costs.

Actual direct benefits from the establishment of the standard were reported by seven producers, while six producers considered the establishment of the standard a benefit to the industry as a whole. A few changes were offered by the producers for consideration by the standing committee. A meeting of this committee is scheduled to be held in Washington, D. C., on February 6, 1932, in conjunction with the annual convention of the American Ceramic Society.

Users of feldspar are particularly requested to submit comment or suggestions regarding revision of this standard to the division of trade standards, Bureau of Standards, for the consideration of the standing committee at that time.

LOCK-WASHER STANDARDS

The proposed American tentative standard for lock washers has been released, by the subcommittee which developed it, to industry for general criticism and comment, according to an announcement of the American Society of Mechanical Engineers. This proposed standard was developed by a subcommittee of the Sectional Committee on the Standardization of Plain and Lock Washers organized in 1926 under the procedure of the American Standards Association and sponsored by the American Society of Mechanical Engineers and the Society of Automotive Engineers.

The development of an American standard for plain and lock washers was first proposed to the American Standards Association in October, 1922, by the War Department. At a meeting of the A. S. A. on October 19, 1922, a special committee was appointed to decide whether or not this project should be approved; and, if so, what its scope should be. The special committee submitted a report in January, 1923, suggesting that the project be undertaken and that the Society of Automotive Engineers and the American Society of Mechanical Engineers be invited to act as joint sponsors. This recommendation was confirmed by the executive committee of the American Standards Association on October 11, 1923.

The proposed standard, now before the interested groups for review, contains not only introductory notes, but also a table of dimensions for lock washers (spring washers) giving the nominal size, actual inside diameter, dimensions for washers for use with wrench head bolts and nuts, and slotted head screws.

Readers of COMMERCIAL STANDARDS MONTHLY desiring an opportunity to examine a copy of this proposal with a view of transmitting comments to the committee, may obtain a copy by addressing their request to C. B. LePage, assistant secretary, American Society of Mechanical Engineers, 29 West Thirty-ninth Street, New York, N. Y.

WOOL AND PART-WOOL BLANKETS

A group of wool and part-wool blanket manufacturers met in New York on the evening of January 11 and developed the following modified draft which they have proposed as a substitute for the recommended commercial standard for wool and part-wool blankets:

1. That no finished blanket containing less than 5 per cent wool shall carry the word "wool" in any form.
2. Blankets carrying the word "wool" in any form and containing between 5 and 25 per cent shall be labeled "part wool," "not less than 5 per cent wool."
3. Blankets containing more than 25 per cent wool shall be labeled with the guaranteed wool content in percentage.
4. Blankets containing more than 98 per cent wool shall be labeled "all wool."

The agreement is proposed to be effective after December 31, 1932, in order to allow more time for the various interests to conform to it.

Indications are that further conferences will be required before a consensus of the entire trade is obtained.

RED-CEDAR SHINGLES

Commercial standard CS31-31, Red Cedar Shingles, has just been released in printed form, according to an announcement of the Bureau of Standards through its division of trade standards. The specification was established through the efforts of the Red Cedar Shingle Bureau with the cooperation of practically all the cedar-shingle manufacturers, as well as many distributors and users, and became effective for new production on July 1, 1931. Copies of the printed standard may be secured from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 10 cents each.

The standard provides for the recognition, sale, and use of high-quality, serviceable red-cedar shingles. The requirements specified include length, width, thickness, grain, defects, color, packing, and grading tolerance of the highest-grade commercial product of the cedar-shingle manufacturer, comprising only those with 100 per cent edge grain and 100 per cent clear heartwood. It also stipulates other exacting requirements that reflect serviceability, such as specific natural defects in the wood, as well as defects of manufacture, uniformity of size, etc.

A glossary of terms is included for the benefit of those unfamiliar with the language of the shingle manufacturers, together with tables showing the covering capacities of shingles of various size and the recommendations of manufacturers as to proper weather exposures, nails, etc.

An additional feature of the standard is the elimination of the "thousand pack" and adherence to the "square pack," which provides a ready means of cost comparison between wood shingles and other forms of roofing. The printed pamphlet includes a list of official acceptors, a condensed report of the general conference, and the membership of the standing committee, which is composed of representative manufacturers, distributors, and users, appointed to review suggestions and effect a revision of the standard when necessary to keep it abreast with progress in the industry.

In order to assure commercial standard quality to the architect, builder, and prospective home owner, the Red Cedar Shingle Bureau authorizes the use of a guarantee label which may be attached to each bundle of shingles. This guarantee is made by the shingle bureau on behalf of the manufacturers, and its provisions are enforced by a competent corps of inspectors who are constantly in touch with the producing mills. A reproduction of this label appears in the printed pamphlet.

SIMPLIFIED PRACTICE IN AUSTRALIA

The simplified practice divisions of the Standards Association of Australia has issued two simplified practice recommendations, which may be described briefly as follows:

Simplified practice recommendation No. 3 covers sheet-metal fittings for exteriors of buildings. These fittings include ridge capping, eaves guttering, round ventilating and down piping, and square and rectangular down piping. The recommendation shows reductions in variety amounting to 92 per cent in the first two items and 83 per cent in the last two.

Simplified practice recommendation No. 4 covers road-gully gratings. The simplified list includes five sizes and types of gratings and six sizes and types of supporting frames.

The procedure of the Standards Association of Australia has been modeled on that of the division of simplified practice of the Bureau of Standards. Australian simplified practice recommendations differ somewhat in form and arrangement from our own but contain exactly similar information, including the recommendation itself, a brief history of the project, summaries of the various conferences, and a list of acceptors. Like our own recommendations, each one also includes a description of the purposes and methods of developing simplified practice, and of the results and benefits to be gained by all concerned.

NEW NATURAL-GASOLINE GRADES

New specifications for natural gasolines, approved one year ago by the Natural Gasoline Association of America, became official on January 1, 1932. After that date grades A, AA, B, BB, and C are to be abandoned as classifications of the various specifications.

The new specifications are based on vapor pressure and the per cent evaporated at 140° F, and will permit of a possible 24 grades.

According to the National Petroleum News (December 23, 1931), surveys have substantiated the belief of the association's technical committee that grade AA and grade 26-70 are equivalent. One of the major companies tested samples from 4,079 tank cars of gasoline shipped the past few months, and found that only 33 cars or 0.4 per cent of the gasoline sold as grade AA disagreed with the grade 26-70 specifications. The magazine further pointed out that a check among manufacturers indicated that the price of grade 26-70 will be used as the base in determining the prices for the less prevalent grades, or for any special grades buyers may require.

FUEL OILS

Upon recommendation of the standing committee in charge of commercial standard CS12-29, Domestic and Industrial Fuel Oils, this standard has been reaffirmed to July 15, 1932, or until revision is authorized by the industry. Announcement to this effect was made to the industry in a circular letter from the division of trade standards, Bureau of Standards, under date of December 29, 1931.

Numerous changes have been recommended from time to time regarding this standard, but unfortunately there is a wide conflict of opinion in the suggestions offered. Some had advocated the discard of certain grades which are extensively sold in other sections of the country, so for the present the six grades appear to be necessary although it is not essential for refiners to produce all of them for regions where little demand exists.

This commercial standard became effective November 7, 1929. The manufacturers of oil burners and many petroleum refiners had long felt the need of uniform specifications for fuel oils. The American Oil Burner Association assumed the initiative in this matter and developed specifications for six grades of domestic and industrial fuel oils with the cooperation of the American Society for Testing Materials and the American Petroleum Institute. In order to bring these specifications into broader use, the cooperation of the Bureau of Standards was requested. Anticipating the benefits to be derived from a commonly understood basis of quality, all interests of the industry freely participated in a conference held in New York City, January 9, 1929, and recommended that the standards be accepted as an everyday basis for the production, sale, and use of fuel oils.

INDUSTRY HAS DEVELOPED 154 SIMPLIFIED-PRACTICE RECOMMENDATIONS TO DATE

During the last quarter of the calendar year 1931 four general conferences were held by various industries for the purpose of developing simplified-practice recommendations. The products covered by these recommendations were wooden butter tubs, dental mouth mirrors, dental rubbers, and singletrees.

Seven existing recommendations were reviewed by their respective standing committees during the quarter. For the calendar year 1931 a total of 36 recommendations were reviewed by their respective standing committees. Of this number 9 were revised due to changes that have taken place in the trade, while the remaining 27 programs were reaffirmed without changes.

In the 10 years that the Bureau of Standards has been cooperating with industry in the development of simplified-practice recommendations, a total of 154 simplifications have been approved by general conferences, and of these, 129 have so far received formal acceptance by industry. A total of 77 recommendations have been reconsidered by their respective standing committees and reaffirmed without change.

The last two years have been marked by a notable growth of consumer request that manufacturers identify the simplified lines in catalogues, lists, and other media. Such identification makes it easy for the

prospective purchaser to adhere to the simplified-practice recommendations when referring to trade literature listing "special" items in addition to those retained in the simplified-practice recommendation.

Manufacturers and distributor acceptors have shown a readiness to comply with this consumer request. The result has been that already all the producers in some of the more closely integrated industries are following this practice of identification when issuing new catalogues.

Of the 129 simplified-practice recommendations that have received the written approval of industries, the one for invoice, purchase order, and inquiry forms (S. P. R. No. 37) has the formal approval of 1,099 acceptors. The second largest accepted recommendation is that covering paper (S. P. R. No. 22) with a total of 972 acceptors.

GRADING AND MARKING OF WILLOW PRODUCTS CONSIDERED BY ENGLISH INDUSTRY

An example of the tendency in England to provide for the grading and marking of all manner of commercial products as a means of guaranteeing quality and thus improving local markets, was furnished in the meeting of the Somerset Rural Community Council, January 4, 1932, to discuss the formation of a county association of willow growers, and the eventual grading and marking of all willow produced in Somersetshire, according to information just received from the American consul at Bristol, England, Roy W. Baker. This contemplated action on the part of the willow growers is in line with the recent similar action on the part of dairymen, cider makers, and others who produce for market, from the land.

Willow growing is one of the ancient industries of Somersetshire and represents a capital outlay that would be little expected in such an enterprise. A surprisingly large area of the county of Somerset is devoted to the growing of willow for use in basket making, packing, etc., and a large number of people derive their livelihood from the growing of the plant and the preparation of its shoots for sale.

It was brought out in the course of the meeting that last year (1931) was one of the worst in the history of the industry, and that the quality of the crop had fallen far below normal. Because of the inferior quality sent to London, England, and other large centers of production, the reputation of the Somerset product has suffered and it was argued that strict grading and marking were necessary in order to win back to the county the prestige it formerly held in this trade.

The Ministry of Agriculture was represented at the meeting as were several local experts in willow culture, and large producers of the wood. The various speakers at the meeting held that rigid grading and marking, to show the various qualities known to the trade, would restore confidence in the local product, stabilize the market, and eventually raise prices. An establishment of a county quality mark, it is hoped, will be only a stepping stone to the inauguration of a national quality mark for willow, which may stem the tide of foreign willow which has recently been coming into the country.

COMMERCIAL LAUNDRY MACHINERY

Tentative programs covering the simplification of tumblers, washers, extractors, ironers, and pressers will be considered by representatives of the commercial laundry machinery trade this month.

In May, 1931, at a meeting of the Laundry and Dry Cleaners Machinery Manufacturers Association, considerable discussion took place as to the possibility of that industry adopting a comprehensive simplification program as a means of eliminating waste. In July a meeting of manufacturers was held in New York City and questionnaires were drawn up covering types of machinery used in commercial laundries. These questionnaires covered washers, ironers, pressers, tumblers, and extractors, and requested data upon which one or more simplified-practice recommendations could be based.

In December, 1931, a meeting of the committee representing the extractor manufacturers was held in New York and a composite report of the survey on extractors was submitted for their consideration. As a result of the report a tentative program was drafted and the division of simplified practice, Bureau of Standards, was requested by the industry to call a general conference bringing in representatives of the laundry owners, as well as manufacturers. This meeting will be held following meetings by the committees representing the manufacturers of the other types of machinery.

SIMPLIFICATION OF DENTAL MOUTH MIRRORS AND DENTAL RUBBERS

Mimeographed copies of the recently approved simplified practice recommendation for dental mouth mirrors has been mailed by the Bureau of Standards' division of simplified practice to all interests for their consideration and written acceptance.

Through the medium of this simplification, which was approved by a general conference in Chicago on November 19, 1931, there are established four stock diameters of plane and magnifying cone socket mirrors.

Several years ago the American Dental Trade Association recognized the benefits inherent in simplification, and appointed a simplification and standardization committee to make a study of current conditions, having in view the elimination of superfluous varieties of the commodities made and distributed by its members and used by the dental profession. For this study the commodities in the industry were classified as teeth, sundries, cement and plasters, equipment, gold, and instruments. The American Dental Trade Association is composed of manufacturers and distributors of dental supplies and equipment, and its members, doing an annual business estimated at \$100,000,000, represent an estimated capital of \$50,000,000.

As a result of the preliminary work of the committee, a group of items was selected for simplification and association recommendations were approved for some. Recognizing the need for the cooperation of all concerned in order to derive the maximum benefit from the movement, the association in March, 1928, requested the division of simplified practice of

the Bureau of Standards to enlist the support of all elements of the industry in the development of definite simplified practice recommendations.

The first three programs were for dental hypodermic needles, dental brush wheels, and dental plaster and investment (packaging). These have been indorsed by the industry and are now available in printed form. A fourth program for sizes of dental-lathe grinding wheels has been accepted by industry and will shortly be made available in printed form. In addition to the recommendation for dental mouth mirrors now before the industry for acceptance, the same conference of November 19 approved a proposed simplification for dental rubbers, veneering, and base. This second recommendation, which establishes names for colors for veneering and base rubbers and a system for their uniform packaging, has likewise been mailed to the industry for written acceptance.

Other commodities now under consideration for simplification are burs, engine stones, bracket tables, and covers, and drawer liners. It is the intention of the association to undertake the simplification of other items as rapidly as conditions will permit.

LABELING OF CANNED-SALMON VARIETY

In years gone by it was the custom of the Indians in the Northwest and in Alaska to catch salmon during the season and dry and store them for winter. The Indians still do this in Canada and Alaska, but most of us get our salmon from cans. The demand for canned salmon has increased greatly in the last 20 years and the salmon-canning business is now one of the largest and most important of the food-manufacturing industries, according to Dr. A. C. Hunter, of the Federal Food and Drug Administration.

Recent discoveries indicate that canned salmon contains vitamin D. It has been known for some time that this fish contains some of the other vitamins and that it possesses considerable food value. "While all of the varieties when properly canned are wholesome, because of the enforcement of the national pure food law, there is considerable difference in the qualities of salmon found on the market," says Doctor Hunter.

There are five leading varieties of canned salmon. The kind generally considered to be choicest is spring-catch Columbia River chinook and this sort generally costs more money than the other four varieties. The others, in order of popular preference, are: Red (or sock-eye), medium red (or cohoe), pink, and chum. There is considerable difference between the genuine red and the medium red salmon, and there is a price differential of approximately 75 cents per dozen cans. Chum salmon is the cheapest kind packed, but it is nutritious and wholesome when properly canned. It lacks the color and oil of the better grades.

The administration quite frequently encounters cases where packers have mislabeled their fish as to variety. For example, medium red salmon has been labeled as "red," a superior grade. The Government has taken numerous actions, under the pure food law, against salmon packers who have been guilty of this sort of mislabeling.

LABELING BREAD FOR QUALITY AS WELL AS QUANTITY

"We see advertised quite commonly these days different types of bread, and we see what seems to me to be some rather exaggerated claims made for them," says Dr. P. B. Dunbar, assistant chief of the Federal Food and Drug Administration.

Bread in common with scores of other foods has value in maintaining a person's health, but officials who enforce the pure food law have always contended that to label a food with the word "health," implying that that food has a special "health merit," is not in keeping with our interpretation of the Federal food and drugs act. The housewife who goes to the store for a loaf of bread should not expect to get a food of special "health" qualities.

Doctor Dunbar, however, does not believe that the purchaser should neglect to read what is printed on the wrapper. For one thing, there will be a declaration giving the weight of the loaf, and there may also be statements which indicate the type or quality of the bread contained therein. The housewife, he says, who customarily asks merely for a large or a small loaf, may find it more economical, price considered, to ask for a certain weight of loaf.

There are many kinds of bread—white, whole-wheat, raisin, rye, Boston brown, Graham, and milk bread. The Government has established official definitions for most of these kinds of bread and bakers are following them.

Officials who enforce the Federal food and drugs act rarely have trouble with commercial bread makers, although, during the past year, the Government took steps to require a change of label on a number of brands of bread which purported to be whole-wheat, whereas the food actually was not that kind.

TERMS ON SIRUP LABELS EXPLAINED

What should the housewife expect for her money when she goes to the store for a can of sirup to flavor the winter-morning pancakes? If she wants a pure maple sirup or cane sirup, should she unknowingly pay for an imitation? J. W. Sale, of the Federal Food and Drug Administration, thinks she should not, and he answers the question this way:

There are three main kinds of sirups on the market—the pure sirups, the mixed sirups, and third, the imitation sirups, which are artificially flavored and colored. Imitation honeys are in this latter class.

The national pure food law requires that honey flavor be made from honey, and maple flavor from maple sap, sirup, or sugar. The cheap sirups are wholesome and valuable in their way, but they must be sold for what they are and not as pure sirups.

The careful buyer may profit by remembering that the terms "cane sirup" and "sugarcane sirup" mean the same thing; that is, that the sirup was made from the juice of sugarcane, evaporated down to a sirup consistency.

A "cane-sugar sirup," however, is not a genuine cane sirup. A can labeled "cane-sugar sirup" contains ordinary refined cane sugar and water, with coloring and flavoring added, if the label indicates the presence of these latter ingredients.

The law goes one step further for the buyer's protection. It holds that descriptive terms, such as

"open kettle," "country made," or "homemade," must not be used on labels of sugarcane or maple sirups unless the sirups actually are made in the way the terms indicate. Mr. Sale says:

Housewives have told us that liquid measure is more explanatory to them than weights in expressing the contents of a can of sirup. The Food and Drug Administration recently suggested to manufacturers that they express the contents of sirup containers in terms of liquid measure so that the buyer will be sure just how much sirup she is actually getting. While many manufacturers have acted upon this suggestion, there are some who have not.

STANDING COMMITTEE FOR PAPER SIMPLIFICATION REORGANIZED

The standing committee in charge of simplified practice recommendation for paper (S. P. R. No. R22), has been reorganized by the industry so as to represent 12 national groups directly concerned with reducing the variety of sizes of basic paper sheets.

Jesse H. Neal, general manager, American Paper and Pulp Association, is acting chairman of the committee pending formal selection of officers at its next meeting. That meeting will consider what changes, if any, should be made in the present simplified schedule to bring the recommendation into accord with current demand and best practice. The committee will be glad to receive from the acceptors or others interested, any comments, criticisms, or suggestions looking to the improvement of the following schedule, which became effective July 1, 1924:

Stock sizes, general printing and publishing:

26 by 29 inches, 29 by 52 inches.
25 by 38 inches, 38 by 50 inches.
32 by 44 inches, 44 by 64 inches.
35 by 45½ inches.

Stock sizes, book publishers: 30½ by 41 inches, 41 inches by 61 inches.

Forms and letterheads (bond, ledger, and writing papers):

17 by 22 inches, 22 by 34 inches.
17 by 28 inches, 28 by 34 inches.
19 by 24 inches, 24 by 38 inches.

All paper substance weights shall be stated in terms of the basic 25 by 40 inch size.

The membership of the newly appointed standing committee is: Jesse H. Neal, general manager, American Paper and Pulp Association, 18 East Forty-first Street, New York, N. Y.; H. F. Barrows, representing the National Industrial Advertisers Association (Inc.); J. F. Miller, representing the National Paper Trade Association; Maurice Saunders, representing the Lithographers National Association; George C. Lucas, representing the National Publishers Association; R. E. Flynn, representing the National Association of Purchasing Agents; A. B. Zerby, representing the Association of National Advertisers; B. D. Stevens, representing printing machinery; W. D. Hall, representing the United Typothetae of America; Benjamin J. Sweetland, representing the Direct Mail Association; H. J. Payne, representing the Associated Business Papers (Inc.), and Joseph M. Farrell, representing the American Association of Advertising Agencies.

SCIENTIFIC, TECHNICAL, AND COMMERCIAL PERIODICAL PUBLICATIONS ISSUED BY THE BUREAU OF STANDARDS

BUREAU OF STANDARDS JOURNAL OF RESEARCH

The new Journal describes the bureau's research results in science and technology. The union of science and its applications in one journal shortens the lag between discovery and application.

All engaged in industry and commerce should have available for current use and permanent reference the Bureau of Standards Journal of Research.

Early in its first year the Journal developed a list of paid subscribers double the anticipated maximum.

This Journal is full of interest to executives and technicians controlling industries and commercial enterprises. It enables them better to promote efficiency by determining the scientific measured controls of process through experimental and theoretical research.

Issued monthly
Subscription price, \$3 per year

TECHNICAL NEWS BULLETIN

The Bureau of Standards periodical with a WAR RECORD! Started during the dark days of 1917 to keep the Army and Navy and other branches of the Government informed of progress in scientific war research at the bureau. Upon urgent request this publication was continued and expanded to serve the Government, science, and industry.

The TECHNICAL NEWS BULLETIN will keep you informed of current progress in the scientific and technical work of the bureau's laboratories, and gives each month a list of the publications of the bureau. A complete cross index is published with the December issue.

You can not afford to be without the TECHNICAL NEWS BULLETIN. Every article is short and to the point. The busiest executive can afford the time to read it.

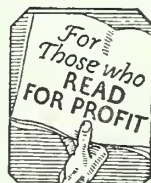
Issued monthly
Subscription price, 25 cents per year

COMMERCIAL STANDARDS MONTHLY

This new governmental periodical is a review of progress in commercial simplification and standardization. It is the only journal of its kind. It covers the national movement initiated by President Hoover for the reduction of needless sizes and varieties of products and the promotion of voluntary commercial standardization by industry.

The Secretary of Commerce in the first issue of this new journal said: "Certain standards, such as those used for weights and measures, * * * have been fixed by legislative enactment. Mandatory standards of this character, however, are few in number when compared with the large and steadily growing volume of standards developed by industry and commerce and voluntarily maintained. * * * The activities of the Commercial Standardization Group of the Bureau of Standards are concerned with standards adopted by voluntary agreement."

Subscription price, \$1 per year



STANDARDS YEARBOOK FOR 1931

The new Standards Yearbook for 1931 is the fifth annual issue of a publication devoted to the great and growing field of standardization in its broad aspects. It gives a summary of progress.

Standardization is a world-wide movement. It covers all industries. It is part of the application of scientific methods to industry. Its achievements are of interest and concern to business men and manufacturers as well as to engineers. To the technician it is full of example of methods and results of suggestive and stimulating value. To business men it discloses trends which deeply concern their interest.

NOW READY Price, \$1 ORDER AT ONCE

"Standardization is becoming an aspect of all well-ordered activity rather than an incidental activity supplemental to others."

To obtain regularly the above-described monthly Periodicals send your order, with remittance, addressed: Superintendent of Documents, Government Printing Office, Washington, D. C. Foreign prices (countries other than the United States and its possessions, Canada, Mexico, Newfoundland, Cuba, and Republic of Panama) are:

Journal, \$3.50; Bulletin, \$0.40; Monthly, \$1.25; Yearbook, \$1.20

THE UNITED STATES DEPARTMENT OF COMMERCE

R. P. LAMONT, Secretary of Commerce

"* * * this department * * * is devoted solely to aiding and fostering the development of higher standards of living and comfort of our people * * * its ideals are clear: That by cooperation and not by compulsion it should seek to assist in maintaining and giving the impulse of progress to commerce and industry in a nation whose successful economic life underlies advancement in every other field."

—President Hoover, at the laying of the corner stone of the new building of the U. S. Department of Commerce, June 10, 1929.



AERONAUTICS BRANCH, CLARENCE M. YOUNG, Assistant Secretary of Commerce for Aeronautics.

Establishment of civil airways and maintenance of aids to air navigation; inspection and registration of aircraft and licensing of pilots; enforcement of air traffic rules; investigation of accidents; encouragement of municipal air ports; fostering of air commerce; scientific research in aeronautics; and dissemination of information relating to commercial aeronautics. (Some of these functions are performed by special divisions of the Lighthouse Service, the Bureau of Standards, and the Coast and Geodetic Survey.)

BUREAU OF THE CENSUS, WILLIAM M. STEUART, Director.

Taking censuses of population, mines, and quarries, water transportation, and religious bodies every 10 years; censuses of agriculture and electrical public utilities every 5 years; and a census of manufactures every 2 years. Compilation of statistics of wealth, public debt and taxation, including financial statistics of local governments, every 10 years; annual compilation of financial statistics of State and municipal governments.

Compilation of statistics of marriage, divorce, births, deaths, and penal and other institutions annually, and of death rates in cities and automobile accidents weekly.

Compilation quarterly or monthly of statistics on cotton, wool, leather, and other industries; annually of forest products.

BUREAU OF FOREIGN AND DOMESTIC COMMERCE, F. M. FEIKER, Director.

The collection of timely information concerning world market conditions and openings for American products in foreign countries, through commercial attachés, trade commissioners, and consular officers, and its distribution through weekly Commerce Reports, bulletins, confidential circulars, the news and trade press, the monthly Survey of Current Business, and district and cooperative offices in 65 cities. The maintenance of commodity, technical, and regional divisions to afford special service to American exporters and manufacturers.

The compilation and distribution of lists of possible buyers and agents for American products in all parts of the world and publication of weekly lists of specific sales opportunities abroad.

The publicity of statistics on imports and exports.

The study of the processes of domestic trade and commerce.

BUREAU OF STANDARDS, GEORGE K. BURGESS, Director.

Custody, development, and construction of standards of measurement, quality, performance, or practice; comparison of standards used by scientific or other institutions; determination of physical constants and properties of materials; researches and tests on materials and processes; and publication of scientific and technical bulletins reporting results of researches and fundamental technical data.

Collection and dissemination of information concerning building codes and the planning and construction of houses.

Establishment of simplified commercial practices through cooperation with business organizations in order to reduce the wastes resulting from excessive variety in commodities.

BUREAU OF MINES, SCOTT TURNER, Director.

Technical investigations in the mining, preparation, and utilization of minerals, including the study of mine hazards, and safety methods and of improved methods in the production and use of minerals.

Testing of Government fuels and management of the Government Fuel Yard at Washington.

Research on helium and operation of plants producing it.

BUREAU OF MINES—Continued.

Studies in the economics and marketing of minerals and collection of statistics on mineral resources and mine accidents.

The dissemination of results of technical and economic researches in bulletins, technical papers, mineral resources series, miners' circulars, and miscellaneous publications.

BUREAU OF FISHERIES, HENRY O'MALLEY, Commissioner.

The propagation and distribution of food fish and shellfish, in order to prevent the depletion of the fisheries; investigations to promote conservation of fishery resources; the development of commercial fisheries and agriculture; study of fishery methods, improvements in merchandising, and collection of fishery statistics; administration of Alaska fisheries and fur seals; and the protection of sponges off the coast of Florida.

BUREAU OF LIGHTHOUSES, GEORGE R. PUTNAM, Commissioner.

Maintenance of lighthouses and other aids to water navigation. Establishment and maintenance of aids to navigation along civil airways. Publication of Light Lists, Buoy Lists, and Notices to Mariners.

COAST AND GEODETIC SURVEY, R. S. PATTON, Director.

Survey of the coasts of the United States and publication of charts for the navigation of the adjacent waters, including Alaska, the Philippine Islands, Hawaii, Porto Rico, the Virgin Islands, and the Canal Zone; interior control surveys; magnetic surveys; tide and current observations; and seismological investigations. Publication of results through charts, coast pilots, tide tables, current tables, and special publications.

BUREAU OF NAVIGATION, ARTHUR J. TYRER, Commissioner.

Superintendence of commercial marine and merchant seamen. Supervision of registering, enrolling, licensing, numbering, etc., of vessels under the United States flag, and the annual publication of a list of such vessels.

Enforcement of the navigation and steamboat inspection laws, including imposition of fees, fines, tonnage taxes, etc.

STEAMBOAT INSPECTION SERVICE, DICKERSON N. HOOVER, Supervising Inspector General.

The inspection of merchant vessels, including boilers, hulls, and life-saving equipment, licensing of officers of vessels, certification of able seamen and lifeboat men, and the investigation of violations of steamboat inspection laws.

UNITED STATES PATENT OFFICE, THOMAS E. ROBERTSON, Commissioner.

The granting of patents and the registration of trade-marks, prints, and labels after technical examination and judicial proceedings.

Maintenance of library with public search room, containing copies of foreign and United States patents, and trade-marks. Recording bills of sale, assignments, etc., relating to patents and trade-marks. Furnishing copies of records pertaining to patents. Publication of the weekly Official Gazette, showing the patents and trade-marks issued.

RADIO DIVISION, W. D. TERRELL, Chief.

Inspection of radio stations on ships; inspection of radio stations on shore, including broadcasting stations; licensing radio operators; assigning station call letters; enforcing the terms of the International Radiotelegraphic Convention; and examining and settling international radio accounts.